A McGRAW-HILL PUBLICATION

Chemical Week

MAY 21, 1960 Price 50 cents

Canadian tariff capers. How they threaten U.S. chemical exports . p. 21

Boom in bottled 'tan' builds market for rare chemical . . . . p. 32

Strategy session in Pittsburgh . . p. 43

Now, low-cost titanium equipment linings. Key: vanadium bond . p. 61

Allergy under attack: corticosteroids prove potency, safety . p. 99

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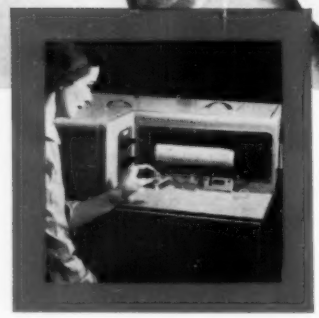

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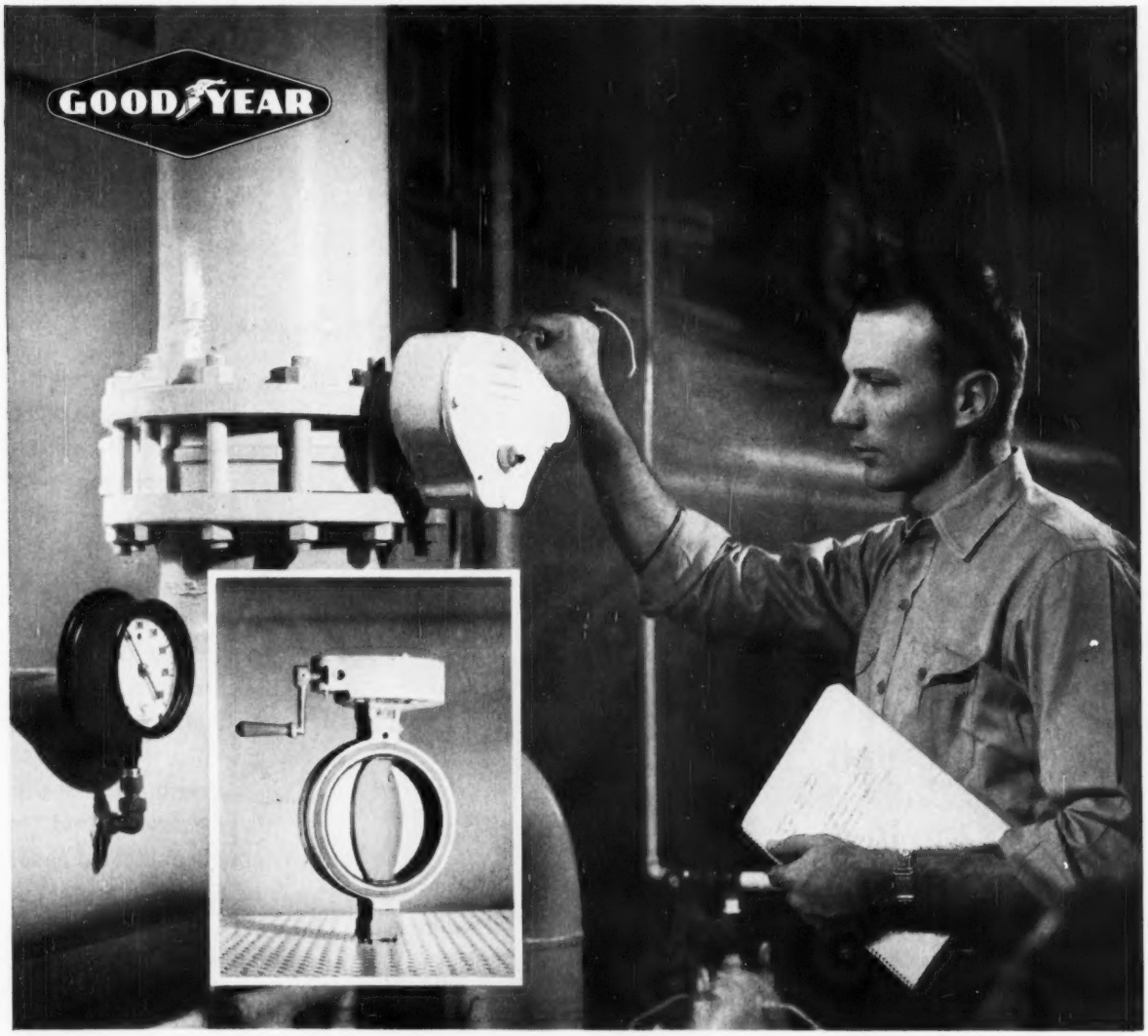
Photograph taken through the cooperation of Central Rubber Company, Belvidere, Ill., and Henry Pratt Company, Inc., Chicago, Ill., manufacturers of seats and valves, respectively.



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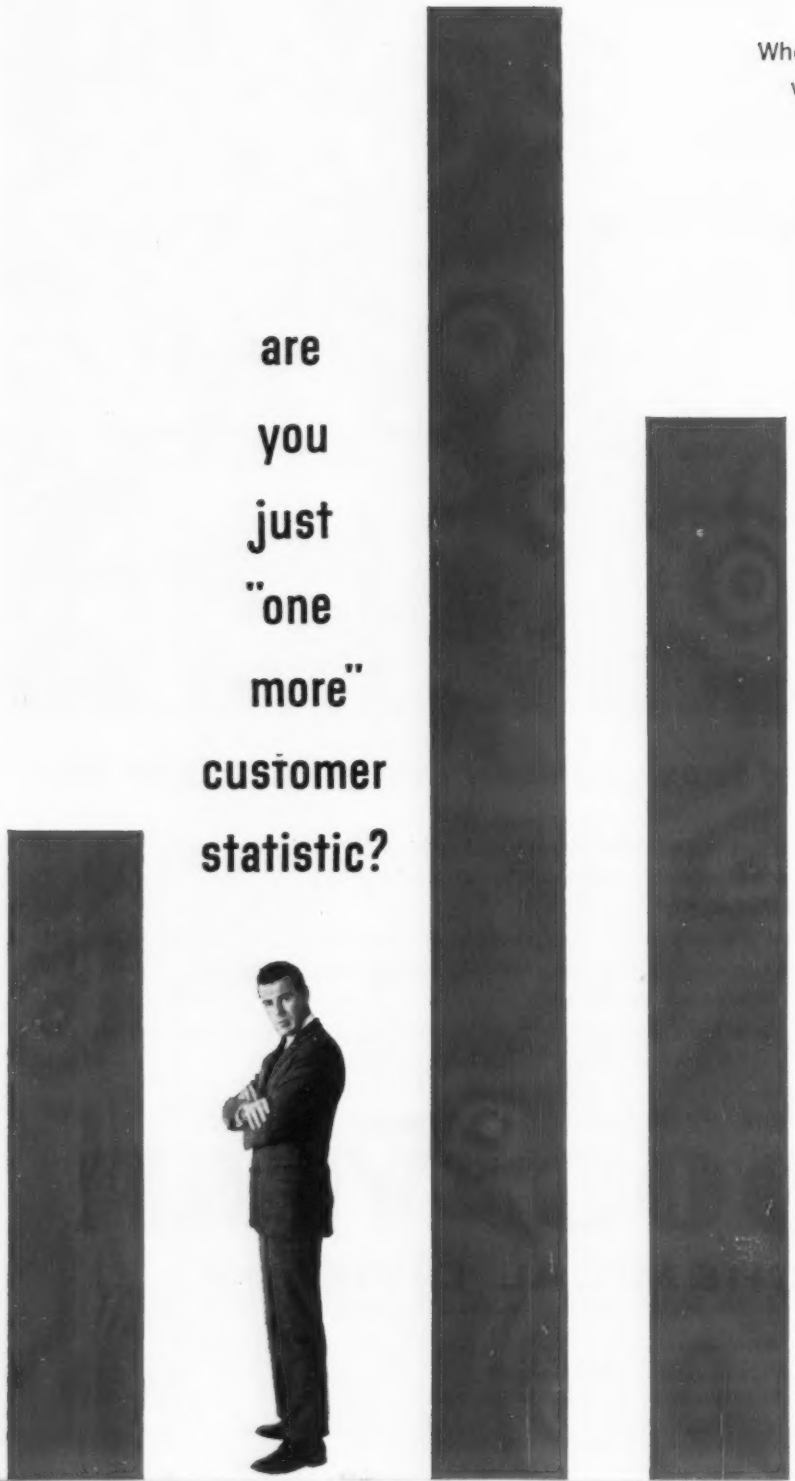

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TOP OF THE WEEK

May 21, 1960

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Chemical Week (including Chemical Specialties and Chemical Industries) **is published weekly by McGraw-Hill Publishing Co.**, James H. McGraw (1860-1948), founder. EXECUTIVE, EDITORIAL, CIRCULATION and ADVERTISING OFFICES: McGraw-Hill building, 330 West 42nd St., New York 36, N.Y. Place of publication: 3rd and Hunting Park Ave., Philadelphia 40, Pa., U.S.A. **Officers of the Publications Division:** Nelson L. Bond, president; Shelton Fisher, Wallace F. Traendly, senior vice-presidents; John R. Callaham, vice-president and editorial director; Joseph H. Allen, vice-president and director of advertising sales; A. R. Venezian, vice-president and circulation coordinator. **Officers of the Corporation:** Donald C. McGraw, president; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, executive vice-presidents; L. Keith Goodrich, vice-president and treasurer; John J. Cooke, secretary.

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United States and United States possessions subscription rate for individuals in the field of the publication, $3 per year; single copies, 50¢. Foreign subscription rates per year: Canada, $4; other Western Hemisphere countries, $15; all others, $25, payable in advance.

Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week, 330 West 42nd St., New York 36, N. Y. Subscribers should notify Fulfillment Manager promptly of any change of address, giving old as well as new address, and including postal zone number, if any. If possible, enclose an address label from recent issue of Chemical Week. Please allow one month for change to become effective.

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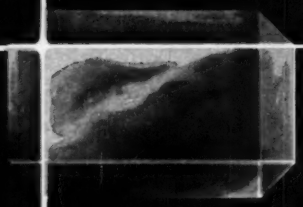

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VIEWPOINT

Our Archaic Antitrust Laws

THE NOMINATION OF ROBERT BICKS as Assistant Attorney General in charge of the Justice Dept.'s Antitrust Division *(see Washington Newsletter, p. 37)* reportedly has been opposed by industry people because Bicks is considered "too militant" in enforcing the antitrust laws. The filing of last year's polio vaccine suit—in which the court decided that the charges simply didn't hold water *(CW Business Newsletter, Dec. 5, '59)*—is cited as an example of how "trigger-happy" the division has been the past few years under Bicks (who has been acting head of the division for more than a year) and his predecessor.

By any standard, there's no doubt that the Antitrust Division and the Federal Trade Commission have been filing a great many complaints in recent years; and it might well be true—as some industry leaders have contended—that these agencies' aggressive enforcement programs have harmed the national economy.

But considering how broadly the antitrust laws are phrased, it would not be amiss to commend those agencies' officials for their self-restraint—or even criticize them for lethargy. Taken literally, those laws put nearly every merger and many other business moves in jeopardy.

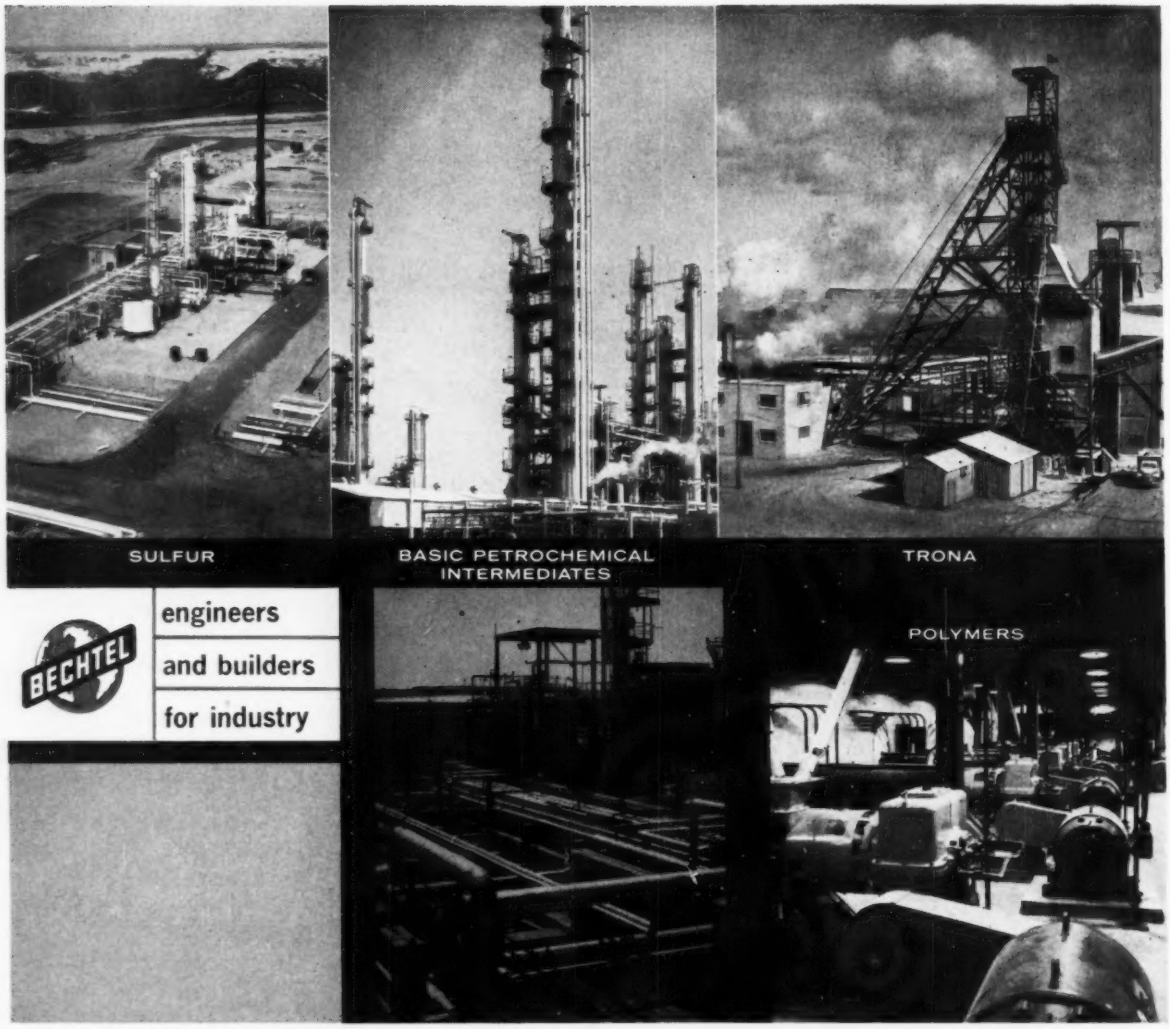
More to the point, we would suggest, is a critical look at the laws themselves.

U.S. industry has changed vastly since Woodrow Wilson signed the FTC and Clayton Acts, and of course the transformation since Benjamin Harrison signed the Sherman Act has been even greater. Other important things have changed considerably, too—most notably, perhaps, the position of the U.S. in world affairs.

A few of the more obvious changes of the past 50-75 years:

- Competition is on more of a free-for-all basis. Example: for most of its principal applications, steel once reigned supreme; but now, in many large-volume fields, it must compete against various plastics, nonferrous metals and alloys, and wood-particle compositions.
- Economic power is no longer concentrated. In sharp contrast to the 1880's, when the "captains of industry" were at their zenith, the nation now has a complex balance of economic power. Among present factors: (a) stronger government, with new concepts of governmental responsibilities. Result has been creation and continual strengthening of such regulatory bodies as the Securities & Exchange Commission, Federal Power Commission, and Food & Drug Administration; (b) division of corporations' control among professional managers and numerous stockholders, instead of control by proprietors; (c) much greater strength for employees, both through their labor unions and through the labor departments of the state and national governments; and (d) greater strength for consumers and the general public.
- Industrial strength and efficiency are now vital to national security. If a given commodity can be produced more efficiently—i.e., with greater economy of manpower, energy and materials—in a few large, modern, integrated plants, then it might well be in the national interest for the government to suggest that the present producers consolidate by merger or acquisition and replace their small, scattered, existing plants.

Without question, business methods, technology, the role of government, and the international situation have profoundly changed since the days of McKinley and William Jennings Bryan. Isn't it possible that the antitrust laws inherited from those days have also become outmoded?



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LETTERS

Right Man, Wrong Firm

TO THE EDITOR: The item (*March 5, p. 70*) concerning a new plastic development at Upjohn was in error. The paper on this substance was given by one of our people, Dr. Bradford H. Walker, at a meeting of the American Chemical Society on Feb. 27, and concerned work that he did while at the General Electric Research Laboratories. . . . The development is General Electric's, not Upjohn's.

WILLIAM H. BAYLISS
The Upjohn Co.
Kalamazoo, Mich.

And GE reports that this was one of several compounds investigated in a long-range research program, and that GE is not now actively considering the commercialization of the compound.—ED.

Consultant's Role

TO THE EDITOR: It's a shame that more business firms don't take advantage of the free services available from insurance companies (*April 23, p. 63*), but you can't put all the blame on business. Many executives have an understandable reluctance to accept a free service from someone who is really in business to sell something.

One way that executives have been able to solve this problem is to work with [an] insurance consultant. Whereas an insurance agent represents his company and a broker attempts to act for both company and client (although paid solely by the insurance company), the . . . insurance consultant is retained by the business firm. Part of the consultant's job is to point out the various free services that are available, and the client usually takes advantage of the free service, knowing that the consultant will assist in interpreting the report.

The . . . consultant does not sell insurance and can, therefore, be completely objective in his recommendations. And the consultant also frequently has a large staff of experts who can advise on a company's entire insurance program if desired.

FRANK J. MEEHAN
Vice-President
John Liner Associates, Inc.
Boston

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

Ink Cooperation

TO THE EDITOR: We read with considerable interest your article "Development of Improved Printing Inks Brightens Future of Fluorescent Pigments" (*April 9*). Just to set the record straight, Procter & Gamble's new Tide fluorescent detergent package started production as the result of a cooperative development of the Ohio Boxboard Division of the Packaging Corp., of America, Switzer Brothers, Inc., and Commercial Ink & Lacquer Co., division of The Borden Chemical Co. We supplied all of the inks on this printing project with the exception of the fluorescent orange, which was supplied by Switzer.

G. E. JACQUES
Commercial Ink & Lacquer Co.
Division of The Borden Chemical Co.
Fair Lawn, N.J.

MEETINGS

Technical Assn. of the Pulp & Paper Industry, coating conference, Edgewater Beach Hotel, Chicago, May 23-25.

The Materials Handling Institute, New England show, Commonwealth Armory, Boston, June 6-8.

1960 International Powder Metallurgy Conference, Biltmore Hotel, New York, June 13-15.

Synthetic Organic Chemical Manufacturers Assn., meeting, Roosevelt Hotel, New York, June 14.

Technical Assn. of the Pulp & Paper Industry, pulp bleaching conference, Edgewater Beach Hotel, Chicago, June 14-16.

Parenteral Drug Assn., Edgewater Beach Hotel, Chicago, June 24.

Columbia University Industrial Research Conference, Arden House, Harriman, N. Y., Aug. 7-13.

Technical Assn. of the Pulp and Paper Industry, alkaline pulping conference, Multnomah Hotel, Portland, Ore., Aug. 22-24.

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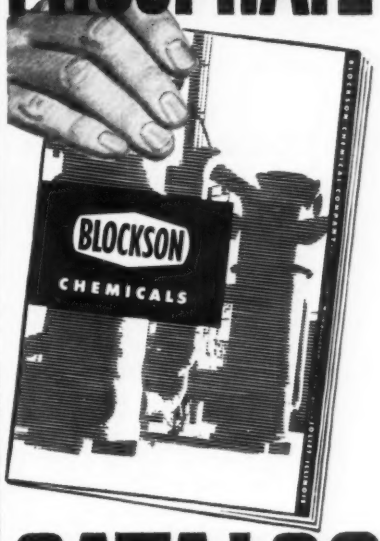

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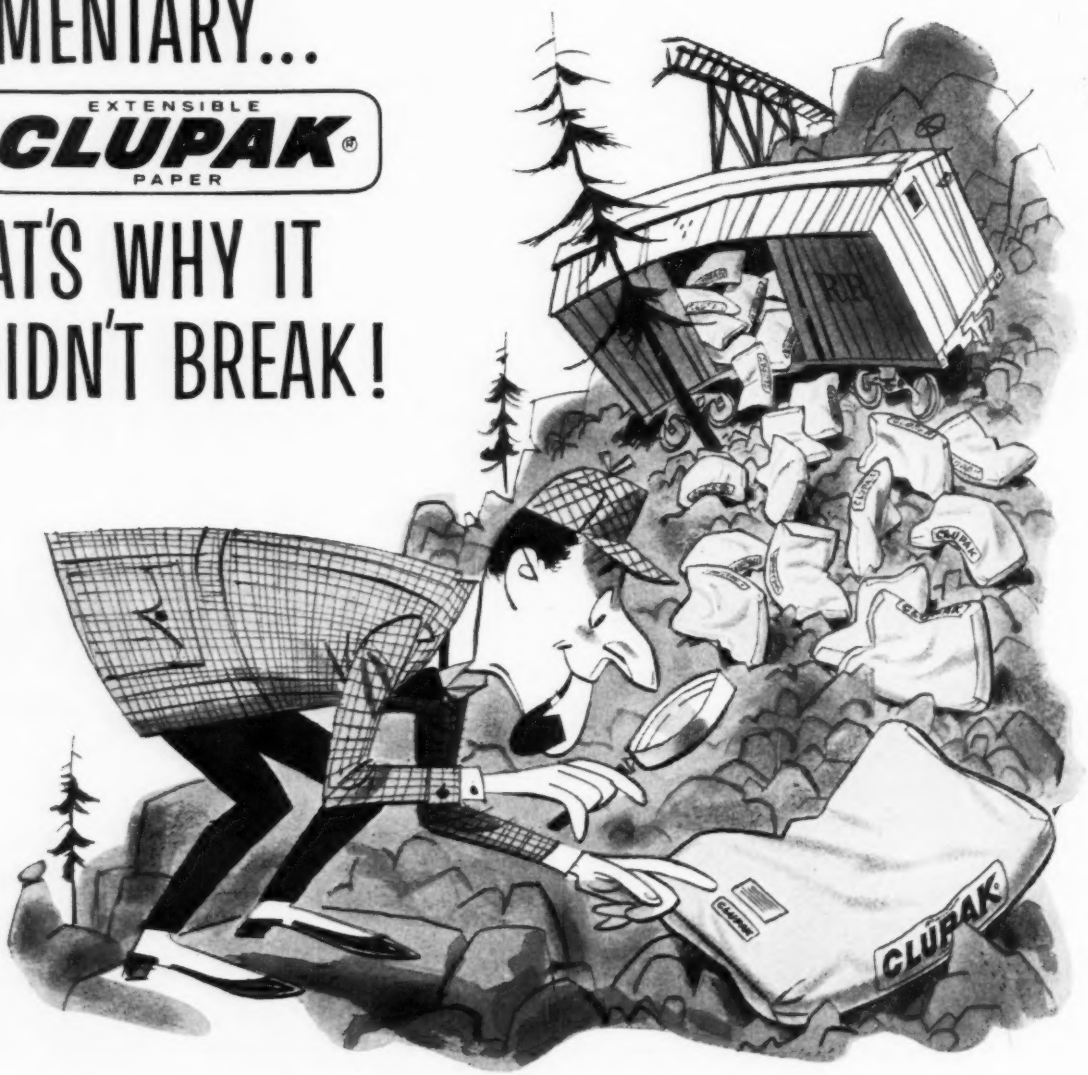

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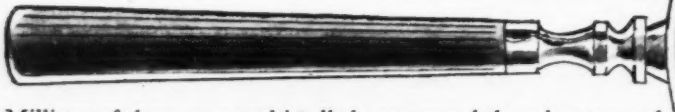

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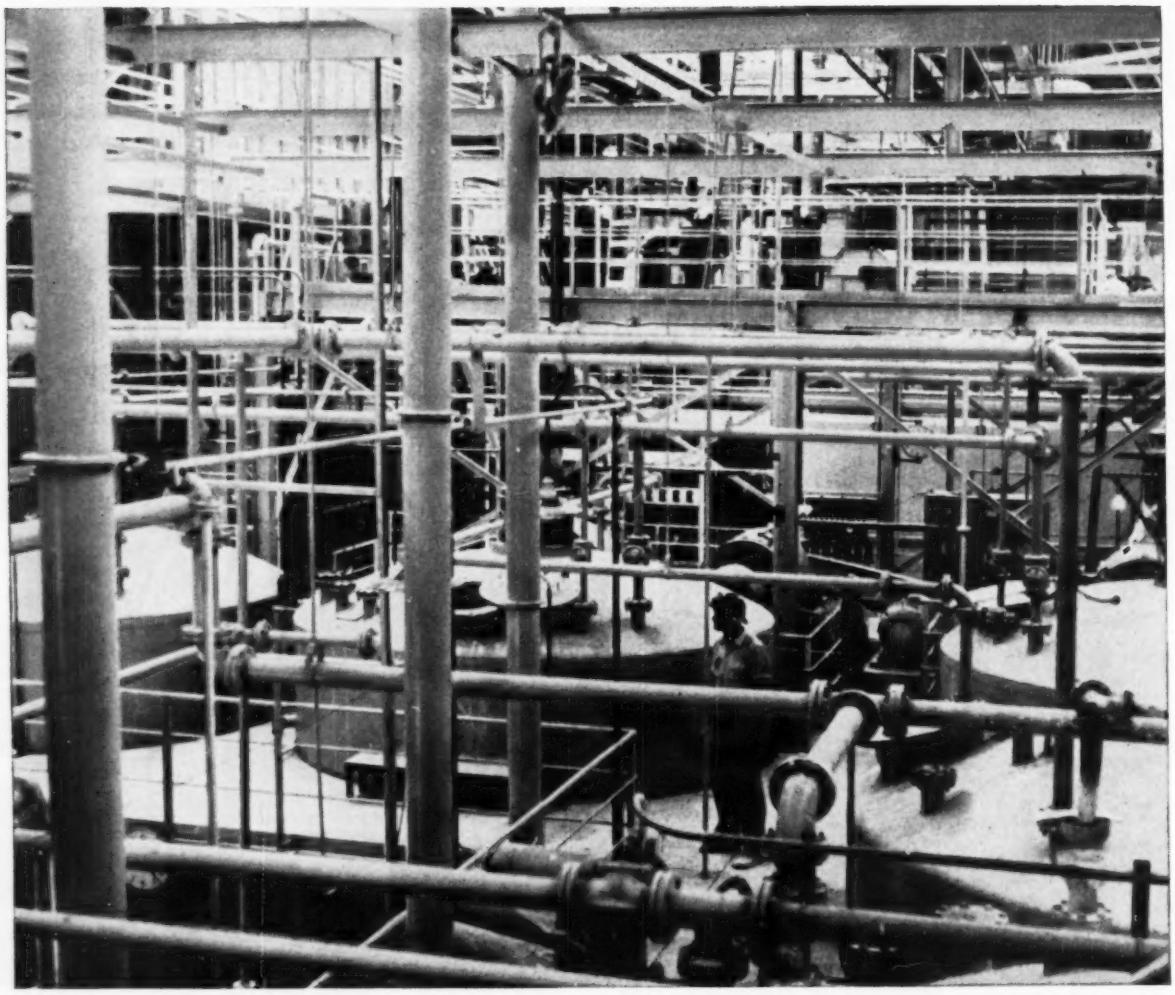

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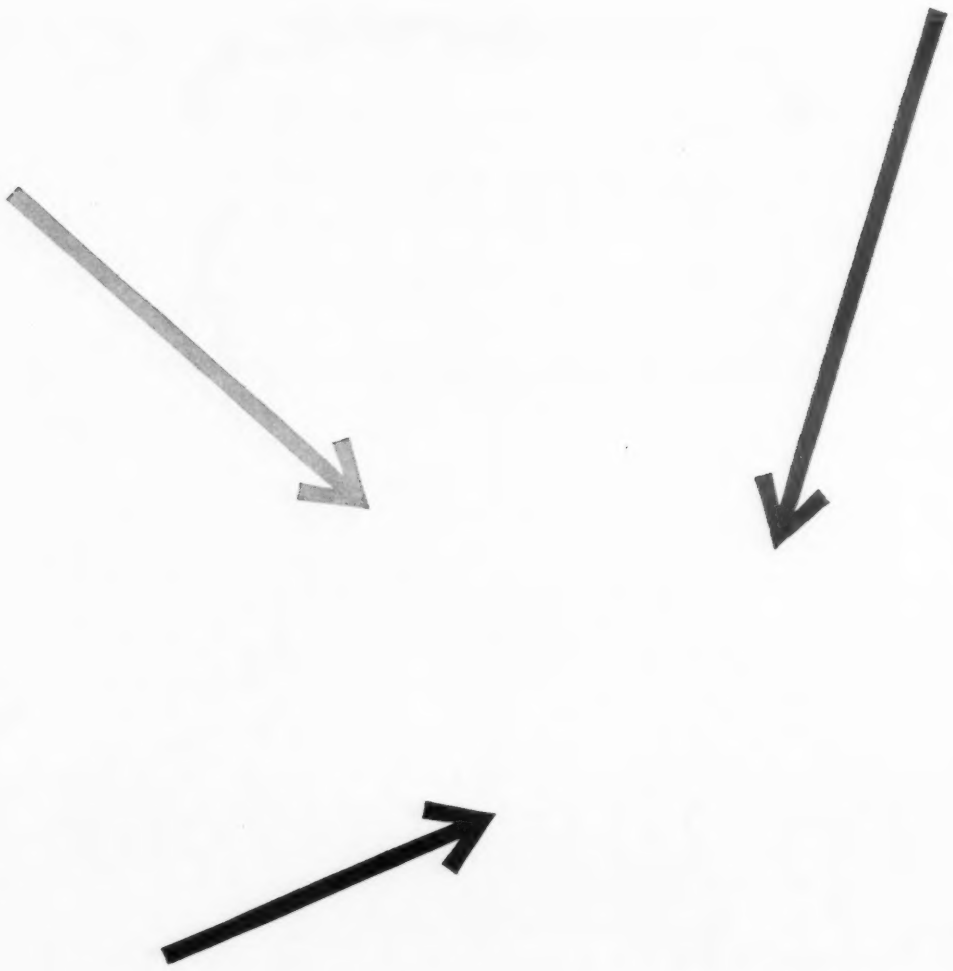

How to know a good thing when you can't see it

Process gases, unlike many other raw materials and intermediates, can't often be seen. But you can always tell where they are used by the way things happen . . . for more and more of these gases are being considered as basic utilities for new or improved chemical processes.

The chemical industry today takes advantage of a wide array of gases produced or purified by low temperature techniques. These include oxygen, nitrogen, argon, synthesis gas, ethylene, methane, HCl, CO . . . and most recently, liquid hydrogen and liquid helium. Air Products is supplying many of them in tonnage quantities to process plants of many types across the nation . . . delivers gaseous or liquefied forms to each customer in the way that suits him best—from a generating plant right at the point of use, or hauled in from a central plant.

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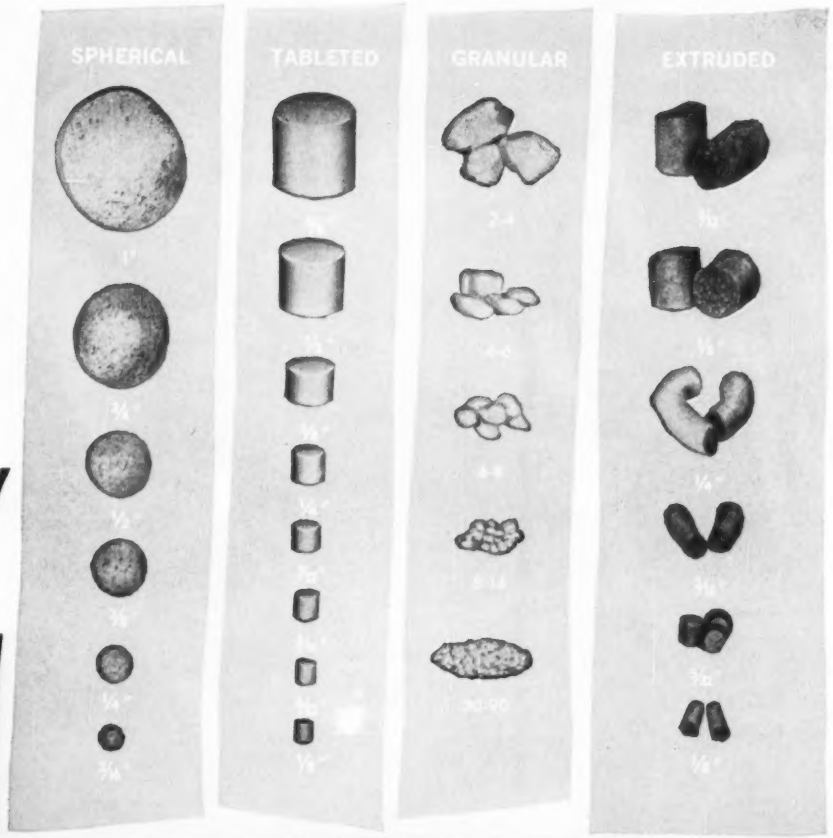

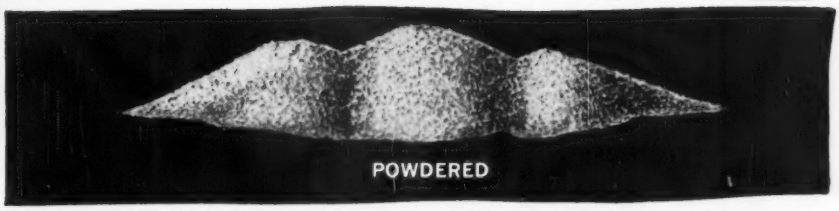

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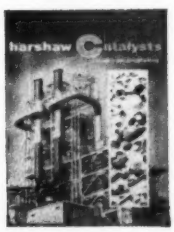

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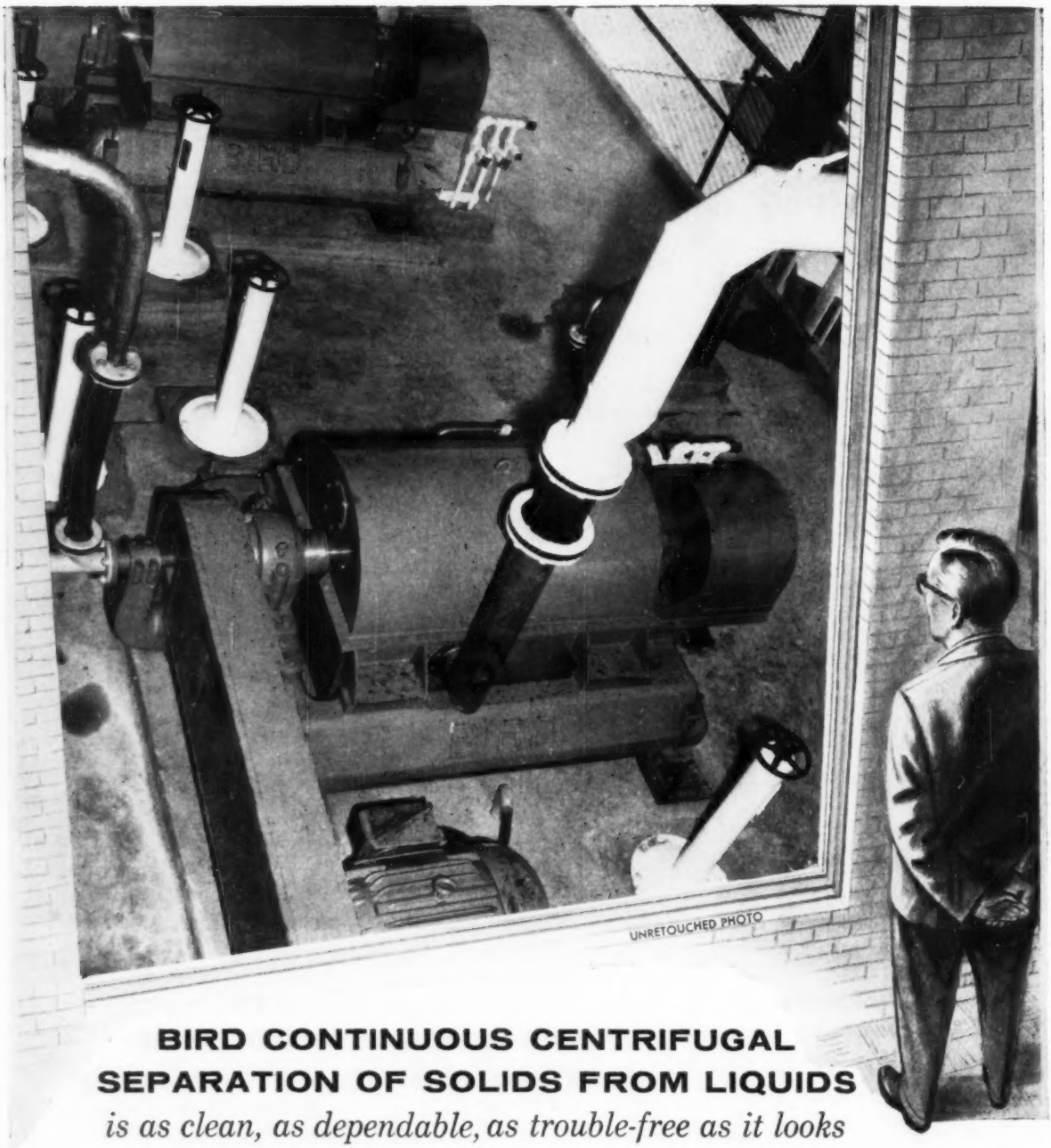

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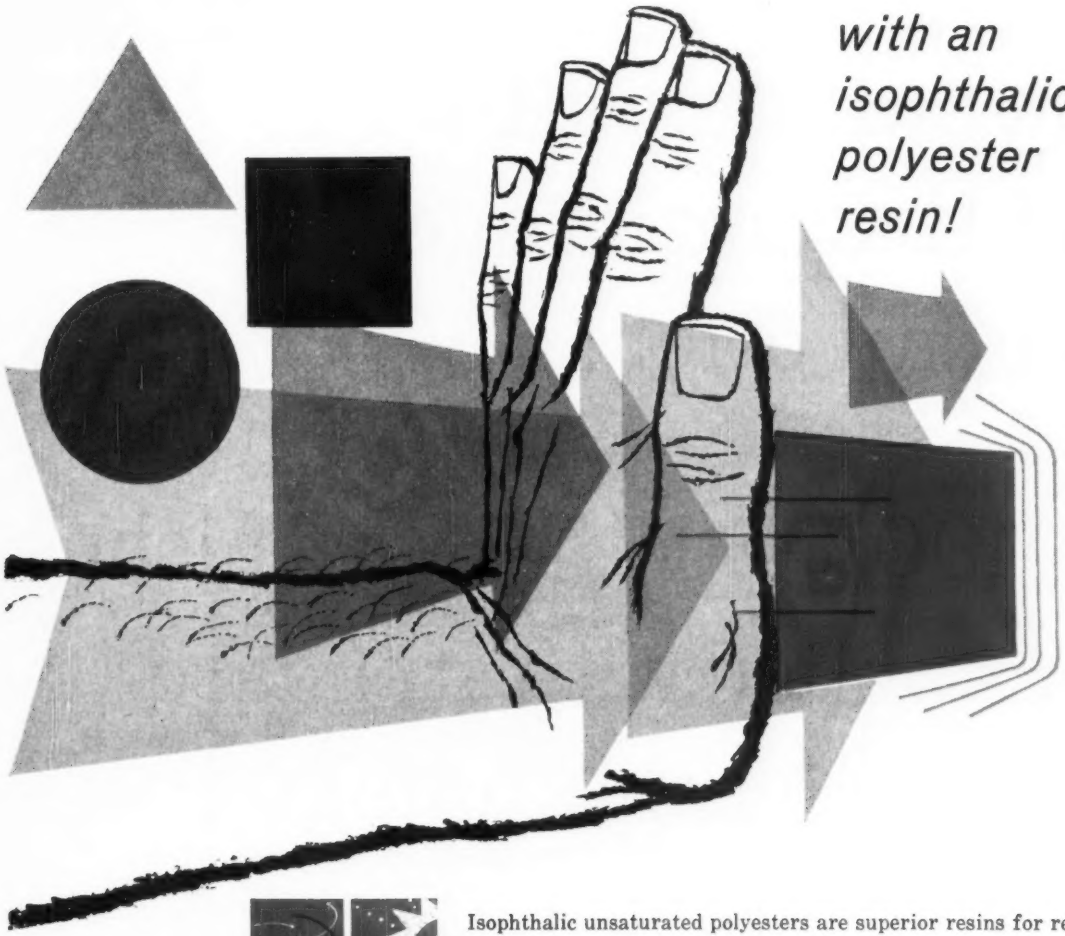

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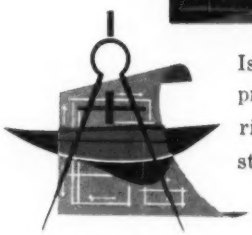

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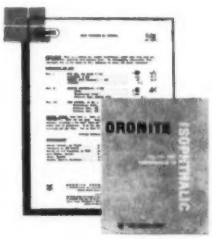

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SHELL

Business
Newsletter

CHEMICAL WEEK
May 21, 1960

The pulp and paper industry is buzzing this week with plans for acquisitions, a merger and big capital expenditures.

• Union Bag-Camp Paper Corp. is well along in negotiations on acquisition of The Crossett Co. (Crossett, Ark.)—a closely held pulp, paper and chemical company. Total purchase price would be close to $156 million. Now under way: a survey of Crossett's timberlands and manufacturing facilities, with a possible UB-C offer to purchase all of Crossett's stock toward the end of the year. Crossett's 2,279,540 shares are held by only about 1,000 stockholders. The company's sales last year: more than $45 million, up $6 million from its previous high.

• Hammermill Paper and West Virginia Pulp and Paper are squabbling for acquisition of one of their big customers, United States Envelope Co. West Virginia, which now owns 25% of USE's stock, is pressing to buy up another 250,000 shares before the annual meeting next month. WVP&P offers $38 per common share, $20 for preferred. But USE still prefers merger with Hammermill, according to its management.

• In Canada, MacMillan, Bloedel and Powell River Ltd. has bought 92% of the stock of Sidney Roofing and Paper, formerly a subsidiary of Eddy Paper. Cost—estimated at nearly $20 million—is said to be $2.5 million more than the price paid by Eddy.

• And two leading U.S. paper companies are boosting capital expenditures. International Paper's President John H. Hinman says his company will spend $100 million this year—the greatest amount ever by the world's largest papermaker. In '59, the total was slightly more than $70 million.

Scott Paper Co. has authorized $31 million for its "sharply stepped-up" capital investment program this year.

•

Latest moves in the Industrial Rayon spat: Harry F. Byrd, Jr., resigned from the company's board; Frederick L. Bissinger, Jr., has moved up from vice-president and general manager to president and chief executive officer, and Hayden B. Kline, formerly president, has been elected chairman of the board (a post unfilled since the death of Hiram S. Rivitz eight years ago).

In Washington, a committee of stockholders has notified the Securities & Exchange Commission it would solicit proxies in an attempt to elect new directors at the annual meeting. It's now definite: the showdown is set for May 27, in Cleveland.

•

A better investment climate in the Philippines may result from the Central Bank's new currency decontrol program, which—if it survives strong opposition—will put the nation's currency on a free-exchange basis

by '64. Aim: to wipe out government corruption and black marketing resulting from the highly overvalued official exchange rate, prop up the bank's anti-inflation program, encourage investors and boost exports. Washington experts call it a step in the right direction, but point out that, for a while, at least, it adds complications to the already complex exchange system. Investors, they say, may still be deterred by the "Philippines First" policy and recently imposed restrictions on profit remittances.

•

Don't expect to ring up big sales as a result of this week's easing of U.S. restrictions on export of some chemical products to the Communist nations. For one thing, the Communists haven't shown any interest in buying those products; if they had wanted those goods, the Commerce Dept. probably would have issued special licenses for exports, anyway. Among the 250 product categories that can now be shipped without special licenses: certain rubber and photographic supplies, tanning compounds, cementing preparations, oil polishes and stains, calcium chloride and salt antifreeze compounds.

•

Monsanto's planned phthalate ester plant on the West Coast— the first for the area—will fill one of the big needs of the fast-growing vinyl plastics industry there (*CW, Sept. 19, '59, p. 38*). The new unit, to be built at the site of Monsanto's polystyrene plant at Long Beach, Calif., is expected to be in operation by mid-'61. Costs and capacity were not disclosed.

While in the past five years vinyl plastic processing has doubled in the nation, it has tripled in the Los Angeles area. Also at Long Beach, Monsanto is doubling plasticizer bulk storage and blending facilities, with completion planned for December.

•

A $50-million petrochemical complex is planned as a joint venture of Borden and U.S. Rubber.

The two companies are forming a joint venture, Monochem, Inc., which would erect a major chemical manufacturing unit using natural gas or low-flash-point liquid fuel as starting material for production of acetylene and vinyl chloride monomer. Present plans call for the subsequent construction of individually owned plants adjacent to Monochem. These later units would use Monochem's output for manufacturing of more than a dozen chemical products.

Monochem will start building later this year. Initially it will produce more than 80 million lbs./year of acetylene, 150 million lbs./-year of vinyl chloride monomer. The venture was planned when Borden and U.S. Rubber determined that their total needs of vinyl chloride and other acetylene-based chemicals would make such a venture feasible.

Under study are industrial sites in Louisiana, between Baton Rouge and eastern New Orleans, and in Texas, between Corpus Christi and Houston.

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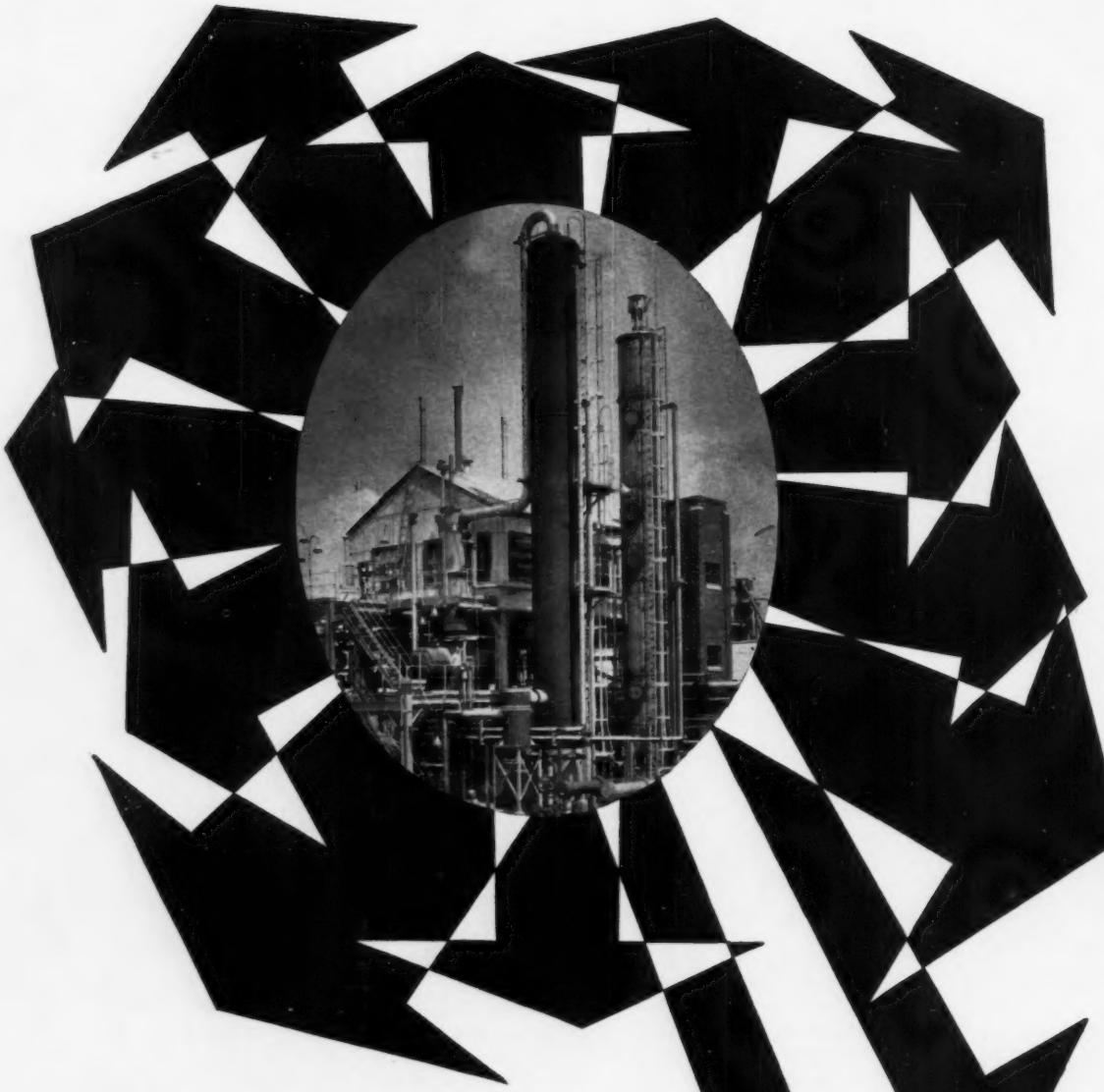

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Chemical Week May 21, 1960

Toe to toe in 'free list' import controversy

FARMER HANNAM opposes 'chemical grouping.'

CIL's ALLEN seeks to halt loss of markets.

Canadians Clash on Tariffs

Canadian chemical producers, seeking a bigger slice of their domestic market, have begun a drive for tariff revision. For Canadian chemical consumers, it could mean higher prices. For non-Canadian chemical makers, it augurs a $100-million/-year slash in their shipments to Canada.

Industry leaders, such as President Peter Allen of Canadian Industries Ltd., argue that the revision is needed for "more equitable tariff treatment." They say imports are largely to blame for a more than 33% drop in profits by Canada's chemical industry over the past 10 years.

But farm leaders, such as President H. H. Hannam of Canadian Federation of Agriculture, fear that the revision would lead to higher prices on fertilizers, pesticides and other farm chemicals. CFA told the Tariff Board of Canada that a key industry proposal—to revise the tariff structure in such a way that rates would be determined by chemical grouping instead of the present end-use grouping—would limit the present tariff exemptions on imported goods for use in agriculture.

Outlook Optimistic: Even though compromises are expected, Canadian chemical industry spokesmen are optimistic. Several of its leaders tell CHEMICAL WEEK they believe "there's more than a good chance" that Minister of Finance Donald Fleming will render "a sensible revision" after receiving the tariff board's report. Hearings on which the report will be based are still in progress.

These industry spokesmen agree, however, that raising tariffs is far from the full answer to making the Canadian chemical industry more profitable. Other issues the industry will have to deal with in the '60s:

- Frenetic domestic industry competition.
- Where to expand.
- Should the government support basic research?
- How can application research be intensified in a comparatively small market?

Import Ratio: While higher tariffs would appear to be a retrogressive action in an era of "common markets," Canada's chemical imports are relatively higher than those of any other country. They amount to "25% of total chemical requirements," according to Du Pont of Canada's President Herbert Lank. The U.S.

Canada's 20 Top Chemical Producers

Company	Principal Products
1. Canadian Industries Ltd.	Heavy chemicals, polyethylene, polyester fibers, paints, fertilizers, explosives, ammunition, coated fabrics, chlorinated hydrocarbons
2. Du Pont of Canada	Nylon, Orlon, intermediates for nylon, cellophane, explosives, paints, linear polyethylene, some heavy chemicals
3. Dow Chemical of Canada	Chlorine, caustic soda, ammonia, polyethylene, ethylene glycol, chlorinated hydrocarbons, ethanolamines, polystyrene
4. Consolidated Mining & Smelting Co. of Canada Ltd.	Ammonia, fertilizers, acids; will produce chlorine and caustic soda
5. Dominion Tar & Chemical Co.	Benzene, toluene, xylene, phthalic anhydride, other coal-tar chemicals
6. Shawinigan Chemicals Ltd.	Calcium carbide, acetylene, vinyl chloride, vinyl acetate and polymers and copolymers, acetaldehyde, related acetylene derivatives; caustic soda, chlorine, sulfuric acid, cyanides
7. Canadian Chemical Co.	Cellulose acetate, acetic derivatives, methanol, formaldehyde, pentaerythritol, propyl alcohol, propylene glycols, butyl alcohols, xanthates
8. Allied Chemical Canada	Sulfuric acid, aluminum sulfate, hydrogen fluoride, fluorides, soda ash
9. Union Carbide Canada	Ethylene glycol, ethanolamines, polyethylene, phenolic resins
10. Polymer Corp.	Synthetic rubber
11. Cyanamid of Canada	Calcium cyanamide, dicyanamide, ammonia, ammonium nitrate, urea, sulfuric acid
12. Aluminum Co. of Canada	Sulfuric acid, aluminum sulfate, caustic soda, chlorine
13. Standard Chemical Co.	Caustic soda, chlorine
14. Naugatuck Chemicals	Pesticides, rubber chemicals, polyester resins
15. Hooker Chemicals	Caustic soda, chlorine
16. Electric Reduction Co. Canada	Phosphorus, phosphates, chlorates
17. Imperial Oil	Butadiene, dodecyl benzene, other petrochemicals
18. Northwest Nitro-Chemicals	Ammonia, fertilizers
19. Monsanto Canada	Polystyrene, plasticizers, other specialty organics
20. Ethyl of Canada	Tetraethyl lead and related compounds

buys only 1% of its chemical needs outside the country; France, 10%; Italy, 9%, and the U.K., 6%.

Most "troublesome" imports, not isolated in the statistical record for '58 (latest figures available): $80 million worth of "plastics"; $13 million of fertilizers; $1.3 million of industrial chemicals; and $92 million of unclassified chemicals, including most of the synthetic organics that the Canadians would like to sell more of.

Principally affected, if tariffs were revised, would be the U.S. chemical industry, which supplies some 85% of Canada's imported chemicals. But U.S. firms exporting to Canada reportedly see no immediate cause for alarm. Reason: Canada's chemical producers will be lucky to get the tariff they want by '63.

On the other hand, four factors underlie Canadian producers' optimism over outcome of the present hearings:

(1) The Progressive Conservative Party, now in power, is traditionally a high-tariff party. Although a number of hard-core conservatives complain that PCP leaders haven't been acting in character since they came into office, there's said to be evidence now that this party, with its very firm hold on Parliament, will be willing to raise some tariffs. Such a move would hurt PCP among farmers, consumers and some labor groups.

(2) The present tariff board inquiry was sparked three years ago by a letter from the Minister of Finance —an indication of government feeling that tariff schedules needed revision of some kind.

(3) Over the past few years, from one-third to one-half of Canada's total commodity trade deficit has been run up on chemical imports. (Industry men point out that this could get worse—that imports of chemicals could exceed exports by $500 million before many years.)

(4) Many Canadians are becoming increasingly worried about Canada's international trade position (the governor of the Bank of Canada has accused Canadians of "living beyond their international means"). This could become an important talking point in the hearings.

But whatever is done about tariffs, the industry hopes for a rational structure for the chemical portion of

the schedule, based on the well-known Brussels Nomenclature and eliminating a host of "end-use" items. (For example, there are more than 90 provisions in Canadian tariff regulations affecting chemicals, permitting certain products to enter Canada free or at special low-duty rates when used for purposes ranging from agriculture and mining to synthetic rubber manufacture. Tossing out some of these exceptions would mean increased protection, even if not a single rate were changed.)

While the five-man board—none of whose members are chemists—starts its biggest undertaking to date, the other problems of future growth in chemicals and allied products are getting close scrutiny from industry executives.

Allen, reporting to CIL shareholders recently, said it is not uncommon to find a number of Canadian chemical producers competing in a market barely large enough to support a single plant of economical size. "Most affected by this situation," he said, "are companies requiring large investment and needing high operating levels to earn a reasonable return."

Case in Point: This month contracts are being awarded for Brockville Chemicals' proposed $19-million, 66,000-tons/year ammonia and derivatives plant at Maitland, Ont. This concern—controlled by Belgium-backed Sogemines Ltd.—reportedly has let major contracts to L'Air Liquide (Montreal), Power Gas Co. (London), and Chemical Construction Co. (New York) for construction of the large ammonium nitrate, nitrogen solutions and anhydrous ammonia and hydrogen plant. Latest estimate: 75% of Brockville's ammonia production will be in excess of next year's Canadian ammonia market.

Another example of too many companies seeking to get a slice of the Canadian chemical pie: polyethylene manufacture. Du Pont of Canada, in its '59 annual report, put the situation this way:

"Return on average operating investment increased to 6% in '59, from 4.9% earned the year before, but has not yet approached the return realized prior to recent expansion. Despite expanding sales and reduced manufacturing costs, no significant return has yet been earned on the large additional sums invested in operating assets."

Some reasons for the lower rate of return: costs of early operating periods of new facilities, increasing labor and other costs, and a marked drop in selling prices.

Yet, while Allen says a number of big U.S. investors in Canada may have been discouraged from Canadian ventures, more European capital and products are coming into Canada.

Wilfred Hall, president of Dominion Tar & Chemical Co., tells CHEMICAL WEEK that competition among Canadian firms is likely to decrease as more companies—having burnt their fingers—pass the lesson along. But foreign competition is bound to get worse.

One example: up until a few years ago, according to Hall, all phthalic anhydride consumed in Canada was produced there. But now, 50% is imported, although the Canadian selling price is 20% below the U.S. price. Reasons: Italian competition, and the absence of an import duty on phthalic for synthetic resins.

If the basic chemical industry is overexpanded, in what areas should Canada look for further growth?

Imperial Oil's Clay Beamer says that by '65, demand for petrochemicals will hit 4.5 billion lbs./year, compared with 2.25 billion lbs. in '59, with production not far behind. Biggest growth area: plastics and resins.

And several industry executives tell CHEMICAL WEEK there should be increasing entry of chemical firms into consumer products rather than industrial products. Within the past year, both Dow of Canada and CIL have expanded in plastic film making and extrusion.

Diversification into fields allied to chemicals is suggested by Dominion Tar's Hall, whose company has heavy interests in the construction products field and controlling interest in a major Canadian pulp and paper producer.

Says Hall: "If we're going to talk about an expanding industry, we should change our yardstick and talk about a much broader chemical process industry."

Pathways for Research: Hall—who next month will move up from vice-president to president of the Chemical Institute of Canada—also has strong views on how Canada's research dollars should be used.

"To stay in position, even though it may be hard to justify economically," says Hall, "Canada will have to attain technological achievements, find where Canadian raw materials can be used to best advantage."

Director I. E. Puddington of the Canadian National Research Council's Division of Applied Chemistry foresees a bigger role for academic and governmental research: "Owing to increasing costs, more basic research will be done in research institutes or government-supported laboratories."

President Hugh Sutherland of Shawinigan Chemicals notes that most other Canadian chemical companies can have their basic research work done by their parent companies. Accordingly, he suggests, those companies will "increasingly stress application research in the coming years."

Latest consensus on the future of the entire Canadian chemical industry in the '60s is that production will continue to go up about 6%/year. Estimated value of output in '59 was $1.4 billion; in '65, it's expected to hit $1.9 billion, and in '70, $2.55 billion. This is in line with the three-year-old Royal Commission Forecast on Canada's Economic Prospects.

But that forecast, though tenable as a whole, now is said to be wrong in parts. For instance, Canada's resource industries have had setbacks. Most outstanding example: uranium. Thus, while more chemicals will help provide a higher standard of living, less will go to Canada's forests and mines.

Second, the world trade picture is gloomy—exports having declined 15% since the publication of the Gordon Commission report, which had predicted a 15% decline only by '65. Third, unless the industry wins its present battle for "more equitable tariffs," chemical imports seem bound to go no way but up.

Du Pont's Lank sums up the situation this way:

"Without encouragement from the government, by selective and judicious tariffs to replace imports with efficient domestic production, the Canadian public cannot achieve the full benefits of a well developed industrial economy." Whether this viewpoint will prevail remains for the current tariff hearing to determine.

Sales Peak Postulated

Financial news in chemical circles was mostly rosy this week. A possibility that chemical industry sales during this year's first quarter may have topped the previous peak attained in '59's second quarter was voiced by the U.S. Dept. of Commerce. And two reports on cash dividend payments show that chemical companies boosted such disbursements to stockholders by about 8%, compared with last year's first quarter.

Preliminary figures of the Commerce Dept. list first-quarter sales of chemicals and allied products at $6.86 billion—up 15.6% from first-quarter '59 and 3.8% higher than the total in last year's second-quarter boom.

The New York Stock Exchange figures that 84 of the 98 listed companies it classifies as "chemical" paid dividends during the first quarter and that their dividends totaled $273 million—up 8.6% from last year's first quarter. Forty-six of the 84 companies paid higher dividends than one year ago; the other 38 companies held to last year's rates. Dept. of Commerce data show chemical companies' cash dividends up 7.8% in the first quarter, to $243.9 million.

Previously unreported financial results for chemical and fertilizer companies continue to show numerous gains along with a few setbacks (*CW, May 7, p. 24*). In the nine months ended April 3, American Agricultural Chemical's net profits dropped more than 60%, to $402,342. International Minerals & Chemical—also reporting for nine months—boosted sales 10%, to $81.8 million, and earnings 47%, to more than $4 million. In the first six months of its fiscal year, U.S. Borax & Chemical hiked sales 10%, to $32.6 million, and earnings 25% to $3.3 million.

American Potash & Chemical tells of a 4.4% rise in sales, in the January-February-March quarter, to $13.2 million, and a 15% rise in earnings, to nearly $1.3 million. Carwin's sales inched up 2.3%, to $810,165; but earnings dipped to $24,376, largely because of startup and conversion expenses and "substantially higher" depreciation charges. Food Machinery and Chemical increased its sales of chemical and other commercial products by 6%, to a record $69.3 million; but sales of defense products slumped 64%, to $7.7 million. Result: a more than 10% drop in net income, to $3.9 million. Stepan Chemical's first-quarter sales and earnings were $5 million and $236,927, respectively. No '59 comparison is possible because figures reported for the year-ago period—$3.5 million and $155,922—do not include operations of Maywood Chemical Works, which was acquired May 1, '59.

Euromart Speedup

The European Economic Community is going ahead with its speedup, but the jolt for outsiders will be more gradual than it appeared a few months ago (CW, March 19, p. 22).

Last week the six foreign ministers of the "Common Market" decided on this plan:

- First moves toward the common external tariff will be made at the end of this year—one year earlier than originally scheduled but six months later than in the earlier speedup plan.
- Internal tariffs will be cut 10% July 1, as originally planned, but the extra 10% cut will be delayed until Jan. 1, '61. Whether to increase the cut slated for the end of '61 from 10% to 20% will be decided later.
- The eventual common external tariff will be lowered 20% from the original goal, but only if outsiders—including the U.S.—reciprocate. No further cuts will be made.

This schedule puts off the trade split with the "Outer Seven" group. The groups will meet in June to work out hardship cases resulting from the speedup. And it reduces tensions by starting the common tariff speedup after this fall's GATT tariff negotiations. Thus, the plan gives more talking time, but it doesn't stop the speedup, or water down the Common Market.

Scoring on Chemicals

While making only "modest" gains in its petroleum business, Standard Oil Co. of California is scoring steeper increases in its chemical sales and profits.

Last week company Chairman Ralph Follis and Vice-President Elmer Peterson cautiously revealed a few more facts about the firm's petrochemical operations:

- A more than 10% increase in petrochemical sales is expected this year. This would bring 1960 petrochemical sales to $155-160 million, about one-tenth of total sales volume.
- While over-all outlays for construction, modernization and oil and gas exploration this year will be about $400 million, the same as in '59, the company is increasing its chemical expansion budget by more than 10%.
- Both industrial and agricultural product sales contributed to Socal's more-than-16% increase in chemical sales (up from $123 million to $143 million). Industrial chemical sales by Oronite Chemical shot up from about $63 million to $75 million; agricultural chemical sales by California Spray-Chemical rose from about $60 million to $68 million. About 25% of the industrial chemical sales was made in overseas markets by California Chemical International. These three companies — Oronite, Cal-Spray, and the international marketing arm—are units of California Chemical Co., a 100%-owned Socal subsidiary.

Latest developments involving these units:

- Oronite's Swiss subsidiary, four French chemical concerns and a French bank are setting up a joint subsidiary, California-Atlantique, to build and operate a *p*-xylene plant in western France. Capitalization: 7 million francs ($1.4 million).
- Oronite's detergent alkylate unit at Richmond, Calif., came into "full production" last month (*CW Market Newsletter, April 9*).
- Under construction at the Richmond site: a 20-million-lbs./year maleic anhydride plant.

Licensing Lucre

Possibly from force of habit, W. R. Grace & Co. stockholders attending last week's annual meeting in New York's Biltmore Hotel directed nearly all of their questions to the company's shipping business. But actually—as President J. Peter Grace emphasized—the company is now primarily in chemicals, which accounted for 68% of last year's pretax operating profits.

And Grace's rise in the chemical industry is being accelerated this year by growth in the petrochemical operations—production, marketing and licensing — of Cosden Petroleum Corp., which became a Grace sub-

sidiary earlier this year (*CW Business Newsletter, Feb. 6*). Cosden's increasing activity in petrochemicals is pointed up by two new licensing agreements:

- Cosden is granting a license to the recently organized Sinclair-Koppers Chemical Co. to use its one-step process in the 70-million-lbs./year styrene plant to be built near Houston, Tex. Sinclair-Koppers has just awarded the design, engineering and construction contract for this project to Badger Mfg. Co., which had worked with Cosden on the process.

Cosden's own Badger-built styrene plant—whose capacity is now being tripled to 60 million lbs./year—has been turning out styrene monomer said to be of 99.6% minimum purity.

- Cosden—producer of polybutene (polyisobutylene)—is granting a license to Naphtachimie (Paris) for use of the Cosden process in a large petrochemical works being built in southern France adjacent to an affiliated company's Lavera oil refinery. Naphtachimie is expected to be the only European polybutene producer.

Another recent Cosden contract calls for Cosden to help market the output of the 120-million-lbs./year *o*-xylene plant being started by Cities Service at Lake Charles, La. (*CW Business Newsletter, April 30*). And Cosden is boosting its own *o*-xylene capacity to 80 million lbs./year.

Last year Grace's chemical operations accounted for $203 million—43%—of total sales volume; and $113 million—49%—of net fixed assets were in chemicals. The $34.2-million capital budget included $15.5 million for chemical expansion.

Partnerships Abroad

New petrochemical projects are in the vanguard of Japan's chemical growth; and petrochemicals are first fruits of Spain's new industrialization program. In both countries, U.S. companies are currently pitching in their know-how and capital in exchange for a large share of the equity.

Union Carbide will have a hand in Japan's newest petrochemical venture. With Nitto Chemical, it has set up the jointly owned Nitto-Unicar Products Co. to produce 27,000 tons/year of polyethylene, according to CHEMICAL WEEK's Tokyo news bureau. As of last week, Carbide's New York office wouldn't confirm—or deny—the report.

Meanwhile, Du Pont's plans to produce polyethylene (with Mitsui) and synthetic rubber (with Showa Denko) in Japan are closer to fulfillment.

Mitsui Petrochemical last week submitted a foreign exchange request to the Ministry of International Trade and Industry (MITI), which has already approved the venture. Du Pont and Mitsui plan to set up a 50-50 joint venture to produce 18,000-tons/year of high-pressure polyethylene. Du Pont will reportedly contribute half of its $9-million share in the form of technology, but will get no royalty fees.

MITI is also reported moving toward approval of Du Pont's synthetic rubber joint venture in Japan. Du Pont is expected to put $1.6 million toward the $6.5-million capitalization of a neoprene plant; Showa Denko will provide the rest.

More to Come: More petrochemical feedstocks will be available in Japan if MITI approves a plan by Maruzen Oil Co., an independent with strong ties to Union Oil. Maruzen has reached agreement with U.S. and West German banks for a $15-million loan to build a refinery and a new tanker. Products would include ethylene and propylene.

These expansions are being proposed even though Japan's petrochemical industry is now running at only 50-70% of capacity, except for high-pressure polyethylene and ethylene glycol. The Petrochemical Industry Assn. is pressing the government to exclude petrochemicals from its import liberalization program.

Strides in Spain: In Spain the first multimillion-dollar project to go up since the new investment law was passed recently (*CW, Sept. 26, '59, p. 99*) will probably be a petrochemical plant.

Standard Oil of New Jersey and Companie Espanola de Petroleo (CEPSA), a privately owned Spanish company, have asked for government approval of a $26-million petrochemical project. If the plans are approved, a new equally owned company would be set up to build the first stage of the project, which would cost approximately $10 million, have an initial capacity of about 24,000 tons/year.

Market surveys haven't been completed yet, but present plans call for production of raw materials for synthetic detergents, plastics and synthetic rubber. Eventually, the new company would probably build plants to use these products captively, possibly drawing in a third investor for the projects, which would raise the total outlay to $26 million.

Proposals for Pakistan

West Germany, bent on increasing its economic influence in the underdeveloped countries and leveling its foreign exchange surplus, is looking to Pakistan for gains on both scores.

CHEMICAL WEEK's correspondent in Karachi reports the Pakistan government is now giving "active consideration" to a report by a team of West German experts on launching a Pakistani petrochemical industry, drawing on the country's large natural gas reserves. The team, which made a study early this year, was composed primarily of petrochemical experts, most of them from plants and laboratories in Bochum.

The Germans recommended more than a dozen plants and are reported to be interested in either investing directly or extending loans or credits, along with furnishing technical skills. Part of the funds could come from the $60-million credit that Germany granted Pakistan last year.

Included in the proposals:

- A Fischer-Tropsch plant to extract petroleum products from gas.
- Acetylene (5-10 tons/day).
- Acrylonitrile from acetylene (5 tons/day).
- Polyvinyl chloride (5 tons/day).
- Methylmethacrylate from acrylonitrile.
- Polyester fibers. (This plant would draw gas from the planned refinery at Karachi. It has high priority on the Germans' investment list.)
- Rayon products, including cellulose acetate (5-10 tons/day). For this project the Germans reportedly recommended using natural gas as the starting material.
- Nylon-6,6, from bagassi grass (5-10 tons/day).
- High-pressure polyethylene, based on molasses as a starting material (3,000-6,000 tons/year).
- Fatty alcohol from coconut oil.

COMPANIES

Unexcelled Chemical Corp. has acquired 58.3% of the outstanding common shares of Oneida Paper Products (Clifton, N.J.), and $152,000 of the $250,000 in 8% debentures issued by Oneida. The latter produces and converts glassine, polyethylene, and cellophane wrappers and bags, has sales of about $8 million/year.

•

Reliance Varnish Co. (Louisville, Ky.) has absorbed Coast Paint and Lacquer Co. (Houston), producer of corrosion-resistant industrial coatings. Coast's '59 sales: $4 million. Reliance's: $10.8 million.

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Vanadium Corp. of America will shut down its Niagara Falls ferroalloys plant June 1 because of increased power, transportation and labor costs.

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American Potash & Chemical and Firth Sterling Inc. will join hands in developing uses for titanium diboride in the aluminum industry. Firth's Borolite Corp. subsidiary will conduct the development work. American Potash will provide the basic raw materials and some specialized equipment and will have an option to purchase controlling interest in Borolite.

•

Minnesota Mining and Manufacturing Co. stockholders have approved a three-for-one common stock split. Authorized common stock was increased from 25 million to 75 million shares. The company's directors have voted to increase the quarterly dividend from $1.60 to $1.80/share (presplit equivalents).

•

International Nickel Co. of Canada shareholders have approved a two-for-one stock split, bringing total shares to 36 million.

EXPANSION

Plasticizers: Tennessee Products & Chemical Corp., a subsidiary of Merritt-Chapman & Scott, will increase capacity of its Alton Park, Tenn., plant by one-third for production of vinyl plasticizers. But declining steel output prompts the company to cut back alloy production at three of its plants.

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Chemicals: Hooker Chemical Corp. will build a $1.5-million plant to centralize semicommercial-scale output of chemicals in the $25-100,000 sales range. It will be part of Hooker's Eastern Chemical Division.

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Industrial Gases: Union Carbide of Canada's Linde Co. Division will build a plant near Bronte, Ont., to supply local industry. It's due in by late fall.

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Ceramics: American Lava Corp. (Chattanooga), wholly owned subsidiary of Minnesota Mining and Manufacturing, will build a technical ceramics plant in Laurens, S.C., as part of 3M's decentralization program.

•

Dimethyls: The Fluor Corp. has started construction of Crown Zellerbach's dimethyl sulfide and dimethyl sulfoxide plant at Bogalusa, La. The 15-million-lbs./-year plant is due onstream this fall *(CW, Oct. 10, '59, p. 17)*.

•

Plastic Containers: Owens-Illinois Glass Co. will open new plants in Chicago and Cincinnati to produce semirigid plastic bottles for household products.

FOREIGN

Phosphate Fertilizers/Morocco: The Shell petroleum group will build an $18-million ammonium phosphate plant at the Atlantic port of Safi. The Moroccan government would hold a minority share. Meanwhile, the state phosphate monopoly has joined with a group of European buyers of Moroccan phosphates to form Sutrima Co. It will build a 200,000-tons/year triple superphosphate plant at Safi. Morocco also is making plans to produce phosphoric acid and chemical fertilizers, using natural gas and locally mined phosphate, expects to undersell European producers.

•

Fatty Acid Derivatives/France: Armour & Co. and Societe de Produits Chimiques et de Synthese (Bezons, France) have formed a 50-50-owned company to produce nitrogen derivatives of fatty acids for sale in Europe and Africa. Name of the new venture: Societe Chimique Armour-Bezons.

•

Solvents/ Egypt: Cairo's newly formed Organic Chemical Industries Co. (privately financed by U.A.R. and Kuwaiti interests) has called for international bids on plants and equipment for producing thinners, butanol, acetone, and acetic and butyric acids. Address: 9 Soliman Pasha St., Cairo, U.A.R.

•

Nylon, Urea/Korea: Korean industrialist Lee Byong Chull will be in the U.S. this week seeking partners or aid for a 170,000-tons/year urea fertilizer plant and a 1.2-tons/year nylon stretch yarn plant. Contacts: Korean embassy or consulates, and U.S. Commerce Dept. field offices.

•

Licensing: Chemische Fabrik Kluthe (Heidelberg), producer of lacquer thinners, removers, cleaning agents, etc., seeks a cross-licensing agreement with U.S. firms. Address: 12 Gottlieb-Dainler Strasse, Heidelberg, West Germany.

Peru Licentia, a Peruvian group, seeks licenses for rubber and synthetic rubber products, industrial chemicals, pharmaceuticals, etc. Address: Apartado 55, Miraflores, Lima, Peru.

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Suggestion from East Berlin

May we have your attention, please, to a 411-word essay on lipase?

Ostensibly it advertises an Eastman Organic Chemical, *Phenyl Laurate* (Eastman 7885). To be sure, 25 grams of this compound may actually be purchased for $3 from the address given at the bottom of the page. Because of difficulty in draping intellectual dignity around a bottle worth $3, it serves our purpose to issue the large, round declaration that enzymes are the most important subject on earth. Does not their interplay govern all activity in the biosphere, including that in the cerebra of men of business and science? Of course.

Permit us now to narrow the scope to one class of enzymes, the esterases. Lipases are esterases that split fats. Other esterases split simple esters of fatty acids. Lipases occur in certain animal organs and plant tissues. Although other esterases are fed into the mammalian blood stream from the liver, the lipase content of the blood serum is very low unless the duct of the pancreas is closed off.

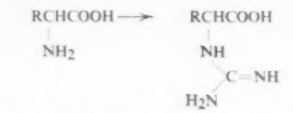
To demonstrate and estimate an esterase, one gives it something (hereinafter designated a substrate) to split under fixed conditions, and one compares the amount of split product against a blank. Olive oil has been the standard substrate for lipase. The fatty acids released are titrated against sodium hydroxide. On page 221 of a certain book it says that this will work for lipase in blood serum. The measurement offers difficulties when the serum lipase level is normally low. It becomes a poor subject for wit when some foul derangement in the human machine raises the level to a point easy to measure.

The subway from East Berlin has brought out of Humboldt University there the suggestion (*Clin. Chim. Acta. 4*, 221) that phenyl laurate nicely liberates phenol in colorimetrically measurable quantity when acted upon by serum lipase. Soon after the news reached us, we prepared this compound for sale because it has good shelf life, where other proposed substrates all too soon split by themselves untouched by lipase. Then we took a different subway to Brooklyn, N. Y., to chat with a biochemist who told us of a considerable improvement in the phenyl laurate procedure.

Whoever will write name and address and the last three words of the preceding sentence on a post card addressed to us will receive an abstract of the Brooklyn procedure as soon as it is published.

Suggestion to Ames, Iowa

Cyanamide (note the "e"; very, *very*, VERY important) is not stable. On that, Walter R. Hearn of Iowa State University and we agree. Dr. Hearn is interested in guanidation of amino groups in peptides and protein, i.e.

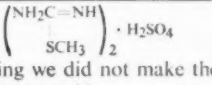


This can be accomplished with cyanamide ($H_2NC{\equiv}N$) and some of its derivatives. There was a problem. In thinking of well known chemical houses with whom to take up a problem involving cyanamide, one doesn't necessarily think first of us, but Dr. Hearn had somehow formed the impression that we were friendly fellows. Another factor which might have contributed to his decision to write us was the fact that six bottles of cyanamide in his stockroom, which showed melting points as much as 150° higher than they were supposed to, happened to bear our P1995 label.

Well, sir, we *did* prove friendly.

We pointed in a friendly way to the "Practical" on that label as an open admission that the *Cyanamide* probably wasn't all cyanamide, though it had been originally. We said that to retard dimerization we kept our stock of *Cyanamide* under refrigeration and advised him to do likewise. We suggested he reclaim the undimerized portion of his stock by dissolving in ten parts or more of ether, filtering off any dimer, and concentrating the filtrate below 35° C at all times. We warned him not to dissolve in less ether because he'd get dimer into solution.

We also answered his question of why our *Cyanamide* (*Practical*) was 25 times as expensive as one of the cyanamide derivatives that he used, our *S-Methyl-2-thiopseudourea Sulfate* (Eastman 1231),



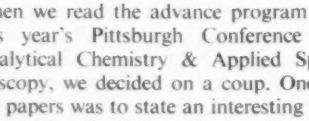
by explaining we did not make the latter from pesky cyanamide.

We further suggested how he might obtain the oxygen analog of this isothiouronium salt which he preferred for some of his guanidation operations. We referred him to a paper by one of our cousins at Kodak Limited in England (*Journal of the Chemical Society, 1955*, 3551), where cyanamide is by-passed by smooth methylation of urea with methyl toluene-p-sulfonate to give a good yield of readily isolated product. Finally we proposed that if he did not want to try this himself we would, for 96 bucks, cash on the barrelhead, deliver to him 500 grams of O-methyl-2-pseudourea sulfate.

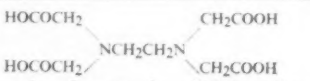
That ought to teach Walter R. Hearn of Ames, Iowa, not to begin a letter with, "Since you have not acknowledged my letter of September 22, I thought perhaps you had gone out of business."

Suggestion at Pittsburgh, Pa.

When we read the advance program for this year's Pittsburgh Conference on Analytical Chemistry & Applied Spectroscopy, we decided on a coup. One of the papers was to state an interesting fact about bissalicylideneethylenediamine, which stands in relation to the well known chelating agent EDTA as



to



When the former, in slightly alkaline *N,N-Dimethylformamide* (Eastman 5870), chelates Mg ions, it becomes highly fluorescent. The excitation maximum occurs at 355mμ, and the emission maximum occurs at 439mμ. A sensitivity of 7 x 10^{-5} micromole of Mg per ml was mentioned.

This time, said we to ourselves, when they come charging out of the meeting room to our exhibit to ask whether we have this reagent, they will encounter no mere bland smile. We will be able to reply, "Yes, sir, here it is, labeled *α,α′-(Ethylenedinitrilo)di-o-cresol* and designated Eastman 8019."

And that is exactly what we were in a position to do that day. The only trouble was that while many people did flock to our booth and talked of many things, not one soul as much as mentioned bissalicylideneethylenediamine.

Same old stand—Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y.

Prices quoted are subject to change without notice.

DPi

Eastman Organic Chemicals

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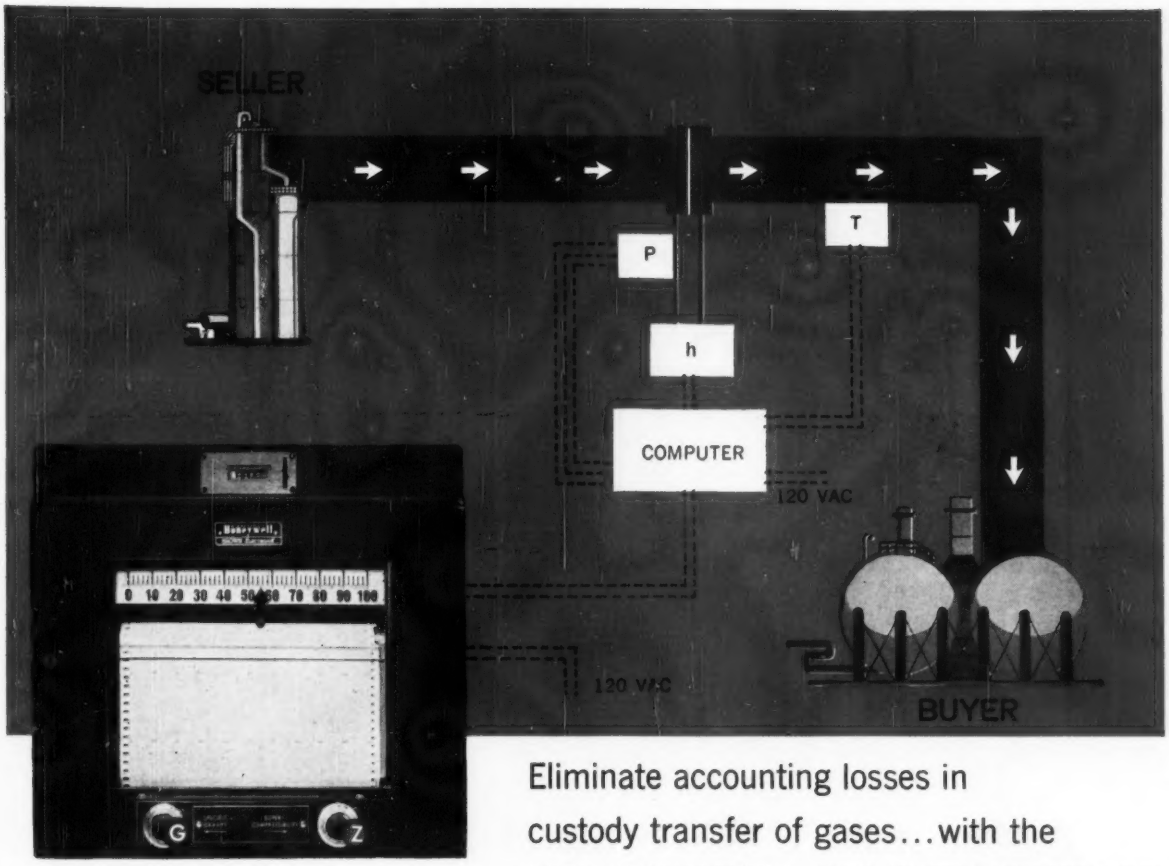

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Where **Q** = mass rate of flow, scfh
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P = static pressure, psia
T = flowing temperature, °R, (°F + 460)
G = specific gravity
Z = super-compressibility
K = orifice flow constant

The *ElectriK Tel-O-Set* △P/I transmitter measures *h*; an absolute pressure transducer measures *P*; and a resistance thermometer bulb measures *T*. The analog computer multiplies *h* by *P* and divides by *T* . . . and sends a resultant millivoltage to the *ElectroniK* recorder. The recorder applies the correction factors G and Z, extracts the square root, and records the resultant mass flow Q.

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Be sure to ask your packaging supplier about Bakelite high-density polyethylene—a new coating material that gives Kraft multiwall bags better moisture protection than low-density coatings of approximately *twice the thickness.*

UNION CARBIDE

BAKELITE and UNION CARBIDE are registered trade marks of Union Carbide Corporation.

Polyvinylidene chloride films have captured big markets in the food packaging field. Attempts at using the material as a coating have not been so successful. Now National Starch and Chemical thinks it has overcome the major drawbacks of the material, is building a 14-million-lbs./year plant to turn out a water dispersion of polyvinylidene chloride resin. Major target: packaging market, now dominated by polyethylene.

Building New Competition in Packaging

National Starch and Chemical Corp. (New York) is this week enlarging production facilities at its Meredosia, Ill., plant. When finished this fall, the expanded plant will have the capacity to turn out 14 million lbs. annually of National's Resyn 3600. The new latex, a water dispersion of polyvinylidene chloride resin, may set up some strong competition with polyethylene for food packaging jobs.

Resyn 3600 is a "50%-solids" material, with the resin particles averaging 0.05 microns in size. It can be applied by standard high-speed coating equipment, and the finished coat is said to retain all the properties of polyvinylidene chloride — extremely low rates of gas and moisture vapor transmission. Already, films (e.g., Dow's saran, Grace's Cryovac) have won big markets, and laminants and even coatings have been produced from polyvinylidene chloride. National's new product, however, may be the first material able to pose a serious competitive threat to other coating materials.

Among the properties that National claims for coatings made from its Resyn 3600 latex:

- Lowest moisture vapor transmission rate (MVTR) of the commercial coatings (about one-third that of polyethylene).
- Almost total resistance to transmission of carbon dioxide, nitrogen, oxygen and other common gases.
- Chemical inertness to a wide range of solvents, acids and alkalis.
- Higher resistance to grease and oil penetration than that of other film resins.

In addition, the material is said to be nonblocking (coated materials don't stick together) after normal drying and finishing operations; to offer good fire retardancy; and to have both ultimate tensile strength and rupture resistance values about three times those of polyethylene.

In most applications the latex can be used as furnished by National—though trailing-blade and roll-coater applications may call for dilution to adjust viscosity. Polyvinyl alcohol is ordinarily used in thickening, but experience favors use of multiple coats rather than a single thick coat.

Although rates of application vary with the substrate, rule-of-thumb measurements for coating requirements (dry resin weight) are in this range: for glassine, 2 lbs./3,000 sq.ft.; for bleachboard, 6 lbs./3,000 sq.ft.; for severe service requirements (flexing, acid attack, etc.), about 10-12 lbs./3,000 ft.

The new latex, on a weight basis, will be almost twice as expensive as polyethylene, but National states that it will give the same protection at much thinner film thicknesses. In addition, National claims that, while polyethylene calls for special adhesives, Resyn 3600 can use standard low-cost adhesives.

No Color Problem: The major drawback in formulating polyvinylidene chloride coatings has been discoloration due to light. National claims that "the problem of discoloration . . . has been significantly improved in National's new Resyn 3600." If National has solved this problem, it will have made a major contribution to the coating art. But some trade observers doubt that discoloration has been completely overcome.

First for Food: National's first target will be the food packaging field, where polyvinylidene chloride films have already become well established.

Some food packaging possibilities for materials coated with polyvinylidene chloride are: linerless boxes for cereal, powder mixes and frozen foods; milk containers; wraps for margarine and butter; and bread wraps.

The coating has been reviewed by both the Meat Inspection Division of the Dept. of Agriculture and by FDA. The former has approved it in direct-contact packaging of meat and meat food products; FDA is considering it in the extended category of products under its investigation.

Outside the food field, a few of the possible applications might be multiwall sacks, soap boxes and wrappers, fiber drum coatings, binders for nonwoven fabrics, and paper backing. Being studied closely is the possibility of using the coatings to line paperboard lube oil cans. Such units would be light weight, easily disposable containers.

Also being investigated is the use of the latex as a protective spray to follow applications of germicides and insecticides; a vapor barrier for gypsum board and other building materials; and as a base for adhesives and wood sealers. It may also garner a minor market as a paint ingredient.

Pegged at 45¢/dry weight lb. and based on present plant capacity, National Resyn 3600 represents potential $3-million/year sales. Obviously, National, with gross sales of around $52 million/year, sees this as a big part of its future business picture.

JAMES M. ZAMUTTO

Beach burned or bottle browned? Their tans may be store-bought.

Bonanza in Bottled 'Tan'

Despite the increasing criticism of many of the synthetic tan lotions now marketed, Rolley Co. (Reno, Nev.) is this week introducing Tansation, which promises to tan either in the sun or in the darkest resort-hotel lounge. The tan lotions are one of the fastest-moving drugstore items in years —one brand alone is selling at a $300,000/month rate.

Tansation and its growing flock of competitors, including the original, Man-Tan, are building a new market for a rarely used chemical, dihydroxyacetone (DHA)—and the four chemical companies supplying it. DHA is the tanning ingredient in all the products now being marketed; and although it has long been known to researchers, it was never in commercial use before.

Solution for Sun-Worshippers: Tanning without the sun or a special lamp was made possible last year when Drug Research Corp. (New York), maker of Regimen reducing tablets, brought out its DHA-based Man-Tan. This was merchandised as an after-shave lotion, which "tanned" in six hours. Also, late in '59, Drug Research began test marketing Positan, a sun tan lotion combining DHA and a sun screening agent.

The spectacular success of Man-Tan has since brought dozens of similar products to the public. The companies marketing them range from bathtub formulators to the largest drug and cosmetic companies.

The list includes Magic Tan made by Leonet Corp. (New York); Tanorama by Tanorama, Inc. (Newark); One, by Paul D. Blackman Corp. (New York); and Tan Tone by Dermay Labs (New York).

Sun tan lotion makers are finding DHA products an ideal supplement to their regular lines. In addition to Rolley's Tansation — the company also makes Sea and Ski sun tan lotion—Plough, Inc. (Memphis), is now marketing Q T (Quick Tan). Plough got into this field through acquisition of Coppertone.

Rexall (Los Angeles) recently came out with Turn Tan synthetic tanner, which is neither an after shave nor sun tan lotion. And most cosmetic companies are also thought to be working on a DHA product, but they're waiting to see whether the fad lasts.

Retail prices vary widely—from Man-Tan's $3 for a 4-oz. bottle to Leonet's Magic Tan at 98¢/4-oz. plastic bottle in variety stores. Most, however, average $1.50.

Rare Chemical Bird: Dihydroxyacetone is a fermentation product of glycerol. It reacts with protein groups of the skin to produce a brown stain. The exact mechanics of the reaction are still unknown because DHA is a highly reactive molecule.

For many years a laboratory curiosity, DHA has been used as a respiratory stimulant and in treatment of diabetes. Price has been the biggest drawback to its commercial use. As recently as last November, DHA sold for $2,000/kg.; the price has been cut to the current $19.50/kg. in 100-kg. orders.

First company to go into DHA production was Wallerstein Co. (Staten Island, N.Y.), as direct result of a request for the material from Drug Research early in '59. Since then Wallerstein has been joined by Chas. Pfizer & Co. (New York), Dawe's Laboratories (Chicago), and Abbott Laboratories (Chicago).

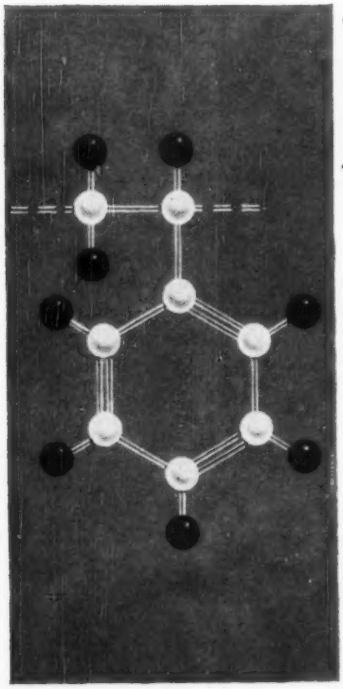
A typical formulation for most of the products now being sold would include dihydroxyacetone (2-3%), alcohol (55%), polyol (2%), plus surfactant, color and perfume in an aqueous vehicle.

Behind the Ad Claims: Despite the soaring sales of DHA cosmetics, marketers are confronted by worries from both the consumers and the government.

The cancer scare has made many consumers reluctant to use a chemical *per se* on their skin, even though marketers of the synthetic tanners guarantee safety.

From a results standpoint, too, there have been problems. Some users complain that the tanners do not al-

BORDEN CHEMICAL PROBES THE NEW WORLDS OF POLYMER RESEARCH



The place: Borden Chemical's Central Research Laboratory at Philadelphia. The activity: the research essential to making polymers do more things *better* for more and more industries. Typical results: better plywoods, better emulsion paints, better coatings. That's not all. Add to the Philadelphia activities the development work going on at seven other Borden Chemical labs. Chances are that an idea "born" at Borden can help *you* find the way to a better product or process. If you have a polymer problem, write The Borden Chemical Company, 350 Madison Avenue, New York 17, N.Y.

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Polyvinyl Chemicals, Inc.
26-22 Howley Street, Peabody, Massachusetts

ways meet their promises, that they do not, for example, produce a natural-looking bronze tan. Oily skin is sometimes said to take on a yellowish tinge; in other cases, the tan is orange-color or blotchy. Also it has been said that the products do not tan scar tissue, that they accentuate acne conditions, and that they give a mottled effect on generally bad skin.

The question of whether the compounds can cause dermatitis, allergies, etc., has not been conclusively determined. One independent testing laboratory believes the products vary as to safety, ranging from more or less innocuous formulations to ones that border on being unsafe. DHA, however, is said to be one of the safe ingredients.

The Food & Drug Administration has admittedly been trying to develop a case against tanner merchandisers for months. Although FDA has not yet lodged a formal complaint, it is still accumulating laboratory evidence for such a move.

Another government agency has already scored against Man-Tan. The Post Office Dept. negotiated a consent decree against the firm's advertising claims early this year. The Post Office objected to ad claims that the product was "actually good for the skin" and "provides Vitamin D like the sun."

A flurry of research activity is now being done by independent labs, essential oil houses, drug, cosmetic and chemical companies to improve the performance of DHA tanners.

Another Hula-Hoop Market? For the cosmetic and drug marketers, the synthetic tanners are proving to be one of their most profitable items in many years. For chemical companies producing DHA, the size of the market is relatively small and there is always the possibility the fad may run out of steam.

In a search for other less spectacular uses for DHA, Wallerstein envisions potential uses in the pharmaceutical field, plus applications as a plasticizer, emulsifier and humectant. The high price is still a deterring factor, but Wallerstein figures DHA can sell for about $2/lb. if enough high-volume uses develop.

Meanwhile, marketers are coming up with new tanning applications. Drug Research will soon introduce Miss Man-Tan, a moisturized foundation cream for the ladies. Leg make-up will appear on drug counters next.

The aerosol industry is not overlooking these successful products as candidates for pressure packaging. A lather-type product is now being developed.

Although the field could be shaken up a bit if patents were issued to any company, it now looks as if a solid $10-15-million retail market is shaping up.

PRODUCTS

Polymer Entries: A new family of water-soluble polymers, useful as adhesives, thickeners, protective colloids and suspending agents is offered by Hercules Powder Co. (Wilmington, Del.). The new group, called Ceron, is available in either nonionic, cationic or anionic forms. Chemically, the products are polymeric, etherified carbohydrates.

•

Cholesterol Fighter: Aluminum nicotinate (called Nicalex) is a new prescription drug by Walker Laboratories, Inc. (Mount Vernon, N.Y.). It's said to lower elevated blood cholesterol levels with virtually no side effects and without dietary restrictions. It is indicated for correction of hypercholestermia as may be associated with diabetes, atherosclerosis, etc.

•

Ion Exchanger: Amberlite 200, a high-capacity, strongly acidic cation-exchange resin is now available from Rohm & Haas Co. (Philadelphia). It is a sulfonated styrene-divinylbenzene copolymer said to feature unusual physical stability and resistance to oxidative attack.

•

Potent Chelating Agent: Nitrilo triacetic acid (NTA) and its salts are now offered commercially by Hampshire Chemical Corp. (Nashua, N.H.) as low-cost, high-potency chelating agents. They're said to have up to 50% more chelating power, as low as one-third the cost of competitive chelating agents such as ethylene diamine tetracetic acid (EDTA).

•

Zinc-Rich Fertilizer: Collier Carbon and Chemical (714 Olympic Blvd., Los Angeles) is offering a new fertilizer blend under the name Brea Brand Aqua-Z. It's a combination of aqua ammonia and zinc.

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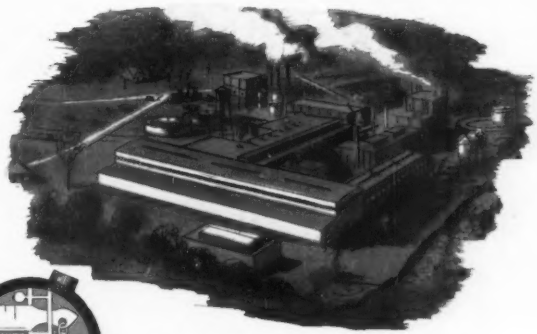

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Washington
Newsletter

CHEMICAL WEEK
May 21, 1960

Nominated last week to head the hard-hitting Antitrust Division of the Dept. of Justice is Robert Bicks, 32, who has been acting chief of the division for more than a year (*see Viewpoint, p. 5*).

Bicks has been a top policy-maker, at the right hand of all the Eisenhower antitrust chiefs, and sat in on the decision to appeal the ruling of Judge LaBuy, who allowed Du Pont to retain its General Motors stock.

Other cases featured on the antitrust docket during his tenure included the Salk vaccine price-fixing case (which the government lost), Parke, Davis price-fixing case (which the government won), and the precedent-setting Bethlehem-Youngstown antimerger case, which he helped argue (also won by the government).

•

More government inspectors in drug plants? That's a strong possibility as a result of the Kefauver drug investigation of generic vs. tradenames. If quality of off-brands were assured, doctors could prescribe them with confidence.

There was expert independent testimony last week, however, that off-brands are not always reliable. Two deans of state pharmacy colleges and the former director of the Connecticut state welfare department testified on the need for better quality control of some off-brand drugs.

Sen. Philip Hart (D., Mich.) has been pushing the idea of increased government inspection, perhaps even assigning an FDA agent full-time to every drug plant, as is done with meat-packing houses. At any rate, FDA spot inspections could be increased. One stumbling block: FDA has only 500 inspectors for the whole field of food, drugs and cosmetics.

•

Mail-order drug houses have won support from the Justice Dept. The department says banning interstate shipment of prescription drugs would place unnecessary restrictions on the consumer's freedom to buy where he chooses. Establishment of several mail-order operations in the past year has retail pharmacists worried.

•

An election-year attack on Washington trade policy is under way. It centers, of course, in Congress, where Democratic party leaders have fired blasts at White House liberal trade attitudes.

Senate Majority Leader Lyndon Johnson (D., Tex.) volunteered his trade views to a group of reporters accompanying him back from a tour of West Virginia, Pennsylvania and Ohio last week. The U.S. trade program, said Johnson, ought to be made more reciprocal. He said he would prefer someone like Sen. Robert Kerr (D., Okla.) to head it.

Washington Newsletter

(Continued)

Kerr, the other leading critic of the Administration's trade stand, has introduced a resolution to halt U.S. tariff cuts scheduled to be offered at the forthcoming international meetings of the General Agreement on Tariffs and Trade (GATT) at Geneva, Switzerland, this fall. These are the reductions authorized in the last extension of the reciprocal trade agreements law in '58.

Kerr's resolution would not be binding on U.S. negotiators at the GATT meetings. But, if passed by the House or Senate, it could have a definitely restraining effect on the Administration's interagency team of negotiators.

The White House has not yet released the list of items on which it intends to offer up to as much as 20% tariff cuts over the next two years. This list is in the making now.

There is talk the Administration itself is divided on the list. Commerce Secy. Mueller is reported to have assured industry leaders last week that the list will be kept at a minimum. But the White House is committed to a plan of offering as many reductions of import barriers as possible to win reciprocal benefits for U.S. exports in return.

Official policy hasn't yet changed—as evidenced by government trade moves. Recently, these important decisions have been taken:

- The Export-Import Bank has disclosed new guarantees against the political risks involved in making short-term credit to exporters. (Some congressmen are proposing that commercial risks be guaranteed as well.)

- The Tariff Commission has refused to recommend new tariff boosts on lead and zinc, and unanimously voted to deny new tariff rates on imported typewriters.

- The Treasury Dept. has released new regulations for handling cases brought by domestic companies charging that imports are being "dumped" in the U.S. at less than "fair value." These regulations, on balance, make it harder for a complainant to prove his case. Treasury also is proposing that the name of the domestic complainant be revealed.

- The Army awarded a $4-million contract for electric towing locomotives for use in the Panama Canal to a foreign low-bidder, Mitsubishi Shoji Kaisha (Japan), over the protests of the nearest domestic competitor—Plymouth Locomotive Works.

The Army gave the bid to Mitsubishi on the authorization of the Office of Civil and Defense Mobilization, which advised that international relations might be impaired if the contract went to Plymouth. OCDM Director Leo Hoegh reasoned that denial of the Mitsubishi bid could endanger a new U.S.-Japan mutual security treaty, now running into stiff opposition in the Japanese Diet.

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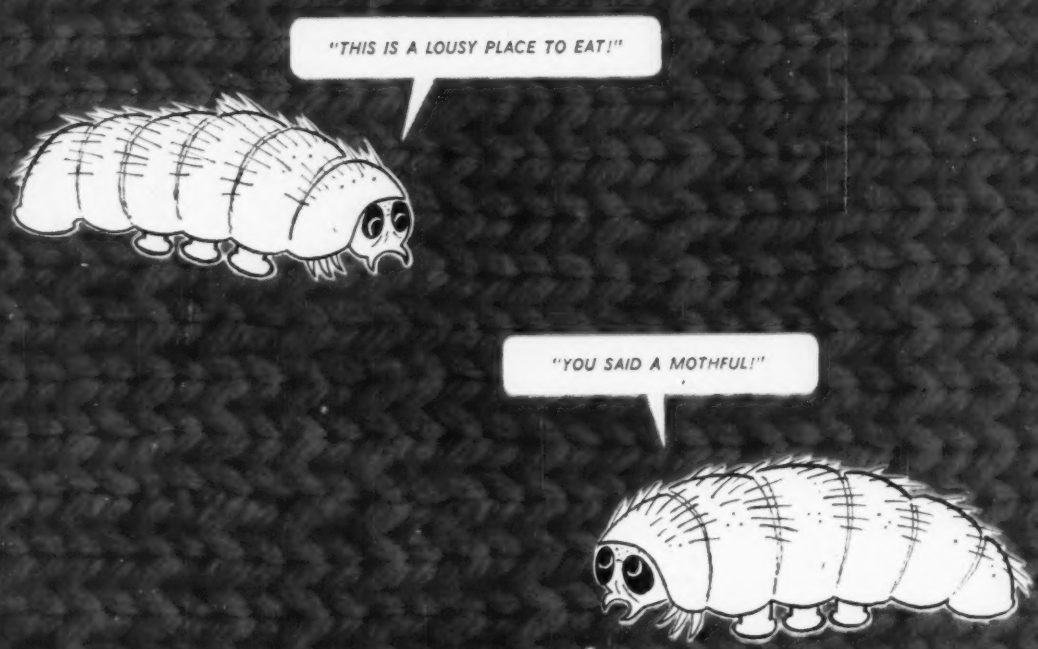
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To get his wings, a moth larva must have a diet of nutrients in the vitamin-B complex—particularly niacin and pantothenic acid. These are present in body oils, spilled foods, and are even synthesized by microorganisms which float in the air and sometimes settle on fabric. So, unless a fabric is 100% clean, it can be a larval smorgasbord.

Certain compounds resemble vitamin-B complex nutrients in chemical structure, but they have no nutritional value and are called antimetabolites. Extensive tests are now underway to develop antimetabolites as a protective treatment for fabrics. On a treated fabric, larvae will nibble the antimetabolites sparingly and eventually die of starvation. Fabric pests, like carpet beetles, will sample the fare, realize it's nutritionally empty, and stomp off in a huff.

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USS Chemicals

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MAKING THE BEST TODAY STILL BETTER TOMORROW

CW PHOTO—ROBERT MONZINGER

Strategists: Pittchem's Menke, McLaughlin, McLennan check island site for new maleic anhydride unit.

Planning Something New for Pittsburgh

Poised over a model of its island-based production complex, top management of newly formed Pittsburgh Chemical Co. last week told how it's molding the firm into the area's only home-grown, home-based chemical producer. For, despite its strategic transportation, raw material, and marketing location, the city boasts no major company that is exclusively a chemicals producer.

Pittchem, a wholly owned subsidiary of Pittsburgh Coke & Chemical Co., was formed last month to coordinate the chemical activities that have contributed to PCC's growth in the past 32 years. Reason for the new arm: Pittsburgh Coke's realization that it had become so diversified —it makes industrial chemicals, resins, coatings, cement, pig iron, coke, and a host of other products—that production management was finding it difficult to operate effectively. Moreover, the company felt that a number of product lines could be married to form corporate families that would strike out on their own.

As a result, the industrial chemicals, protective coatings, and activated carbon divisions became Pittsburgh Chemical Co. — a name that was bought for a tidy sum from a local distributor of sanitary chemicals.

Other operations of the parent company were formalized either as subsidiaries, or, in the case of coke and iron, as a division.

New Self: Now, says Pittchem President Kenneth Menke, the company has the name, organization and, what's more, the autonomy to carve its niche as Pittsburgh's chemical producer. Around him, Menke has a youthful staff—average age is less than 45—headed by Executive Vice-President Henry Avery, and vice-presidents and general managers, Duncan MacLennan, Jonathan Cooper and Arthur Gray, of the Industrial Chemicals, Activated Carbon, and Protective Coatings Divisions, respectively.

The company is now ready, say the managers, to exploit its basic positions in coal-based chemicals, as well as to expand. On the docket right now are plans for a new, $4-million activated carbon plant, for the Catlettsburg, Ky., area, and a similar investment in a 20-million-lbs./year maleic anhydride plant at Pittsburgh to use benzene from the parent firm's coke operations.

New Outlook: The creation of Pittchem is a major development for the company psychologically and, it hopes, commercially. The move for-

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mally symbolizes the firm's willingness to break away from the Neville Island base that has been both wellspring and prison for many years. It may help break down the well-founded, but commercially stifling, image of an organization tied to the need for selling coke and iron manufacturing by-products, and wholly dependent on table scraps at the heavily industrialized island.

Just how inaccurate that picture is can be shown by the fact that the Industrial Chemicals Division alone has to buy some 80% of its raw materials from off-island sources. Indeed, even in such basic items as benzene, naphthalene and tar acid oils, the company has to go outside for supply. And this practice may become even more common.

Mother Island: But to appreciate the company's broadening outlook an understanding of its insular past is helpful. Neville Island — situated in mid-Ohio River, some four miles downstream and west of Pittsburgh's "Golden Triangle"—was the location of a single blast furnace that was bought in '28 by Davison Coke & Iron Co. (Davison later became Pittsburgh Coke & Iron.) In '29, Davison management started coke-gas-based production of the light oil trio — toluene, benzene, xylene — plus ammonium sulfate.

Later, in '40, a continuous tar still opened up vistas in naphthalene, phenols and cresols, and the firm also began production of pyridine, picoline and sulfuric acid—all based on coal gulped by the greatly enlarged coke and iron operation. During World War II the company added activated carbon facilities to supply nearly all armed forces gas mask needs.

By '56 the company had changed its name to Pittsburgh Coke & Chemical to acknowledge its growing part in chemicals, had formalized its chemical divisions on a separate profit and loss basis, and set up an engineering staff. Moreover, it painfully divorced itself from unprofitable agricultural chemicals manufacture and the complexity of fine-chemicals and dye production. Two years earlier, incidentally, it suffered a $200,000 construction loss when it backed out of projected DDT manufacturing.

New Image: Now, stripped down for profitability, with a new name and autonomous management, Pittchem hopes to build a new image. It has already completely redesigned its trademarks and symbols to distinguish it from the parent company; one of the new plants will be built away from the Neville Island base; the company is exploring new markets and new lines.

Hope is, says Menke, that in five years, the '59 sales of $25 million will have been doubled, and capital investment program of about $25 million will have been accomplished. And it's possible that some new divisions may result.

Take the Protective Coatings Division, for example, which now contributes about one-third of Pittchem's sales. Although the company's tar-base thick-film coatings and asphalt-gilsonite mastics are expected to maintain a stable growth, the highest hopes of management are with the Tarset "coal tar pitch epoxy resin system." Bill McLaughlin, division field sales manager, reports that the company is testing the substance for a whole new concept of formable materials outside the coating field. Some possibilities: formed gaskets for concrete pipe, molded encapsulators for electrical use. The division believes that this noncoating line will outpace the rest. Right now it thinks it has about 35% of its specific coatings market, for which it competes with three other major producers.

But the other divisions aren't holding still, either. Industrial chemicals —which posts over half of chemical sales—is also looking at new developments. At present it produces fumaric acid (2 million lbs./year), phthalic anhydride (35 million lbs./year), and will soon be filling out its dibasic acid position with the new maleic plant. A major contributor is its line of plasticizers, which it turns out at the rate of about 36 million lbs/-year (claimed to be roughly 10% of the total market). It is in the plasticizer area, says MacLennan, that new developments are likely to come soonest. For the long range, he reports, the company is definitely looking at the possibilities in oil and natural gas (probably for plastics applications), although no plans have been made.

The Activated Carbon Division, which has a snug and comfortable

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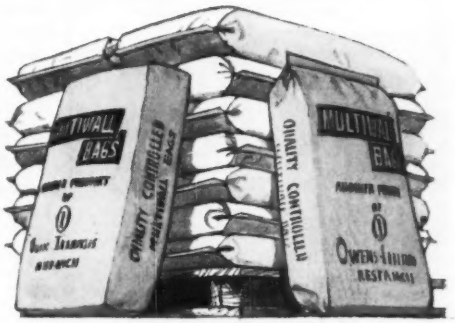

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ADMINISTRATION

berth as one of the nation's major producers, is exploring ways to expand operations in adsorptive and gaseous treatments.

Pittsburgh Chemical has high hopes. In fact it says it has a staff capable of carrying double the company's present business. Planned are two major expansions, at least one in what should be a highly profitable line. Streamlined and on its own, the company hopes that chemical users, at least, will soon begin thinking of Pittsburgh less in terms of iron and steel and more in terms of chemicals.

LABOR

Drug Pact: Merck & Co. and Oil, Chemical & Atomic Workers have agreed on a two-year contract calling for an 8¢/hour wage increase for 2,750 production and maintenance employees including about 1,100 at Merck Sharp & Dohme Division plants in Philadelphia and West Point, Pa.

•

Carbide Hike: At Union Carbide Chemicals Co.'s Texas City, Tex., plant, the Texas City Metal Trades Council accepted an 11¢/hour pay boost retroactive to May 1, and an additional 2¢/hour effective Oct. 1. The council represents 15 craft unions, under a three-year contract with Carbide that expires June 15, '61. The negotiations produced a comprehensive type of medical plan, cost of which is shared by company and employees.

•

Metals Strike: Lead and zinc mine and smelter workers have struck and closed down the Kellogg, Ida., operations of Bunker Hill Co. The strike was called by the Mine, Mill and Smelter Workers Union and affects some 1,800 workers. The union has asked 30¢/hour in wage and fringe benefit increases with an 8¢ boost retroactive to last July, has threatened to extend the strike to 1,000 other workers in the area if bargaining with other companies "doesn't show more progress."

•

Oil Bargaining: Five regional conferences by OCAW local delegates have been completed toward formulation of a national collective bargaining policy for upcoming oil contract negotiations. Major points called for: substantial wage increases; improvement of fringe benefits, especially hospitalization and medical plans; greater union control over administration of fringe benefits; a halt to the use of outside contractors for work "normally performed by employees;" a shortened workweek, when needed.

LEGAL

The Law's Delay: Plastics makers looking for early settlement of linear polyethylene patent rights may as well resign themselves to a long wait. That's the upshot of a check last week with lawyers handling litigation in the two-year-old Du Pont case against Phillips Petroleum and Phillips Chemical (*CW, July 5, '58, p. 22*). Lawyers see little likelihood that the case will come to trial this year.

The case, which alleges infringement of Du Pont's linear polyethylene patent, is now in the "pretrial discovery" stage. Both sides are trying to find out as much as possible about the other's case. This involves depositions, examination of documents and splitting legal hairs. Any court appearances in the immediate future will probably involve complaints about access to documents.

The case is before Federal Judge William H. Kirkpatrick, retired judge of the Eastern district of Pennsylvania, who was assigned after Delaware district judges disqualified themselves because of stockholdings in either or both companies. The last hearing was 11 months ago, and no others are in sight. One lawyer sees "nothing amicable" in the present position of the parties.

•

Pollution Suit: Masonite Corp. is facing a $186,000 damage suit in Hattiesburg, Miss., filed by L. I. Jones and his wife, who operate a fishing camp and own 160 acres along the Leaf River in Perry County, Mississippi. The suit claims that waste products from the Masonite plant at Laurel, Miss., have ruined fishing in the river during certain periods and that the Joneses have suffered property damage.

The couple, who say they have operated a fishing business there for 19 years, also sold real estate. They claim that when stream pollution started, people stopped coming to the camp and lost interest in property.

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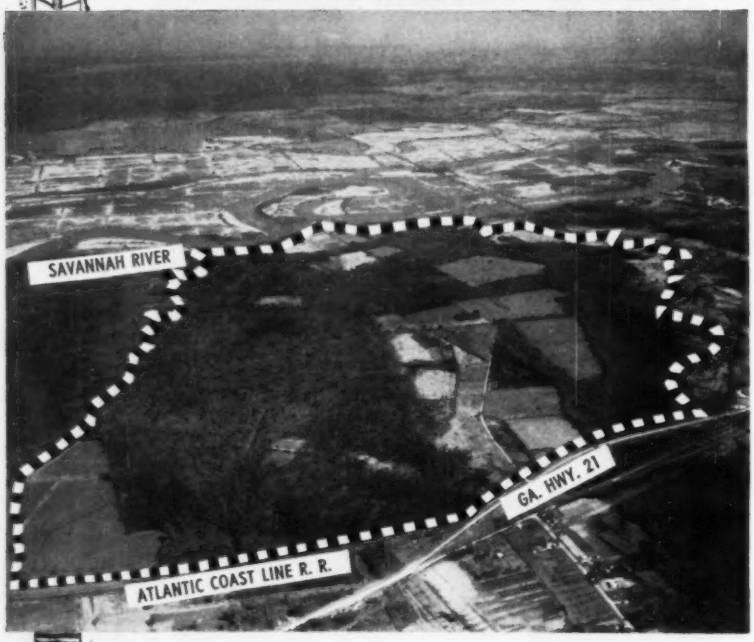
Dept. 752-E, 180 Madison Avenue, New York 16, N. Y.

Canadian Affiliate: Canadian Chemical Company Limited, Montreal, Toronto, Vancouver.
Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Ave., N. Y. 16.

Celanese CHEMICALS

RIVER FRONT SITE!



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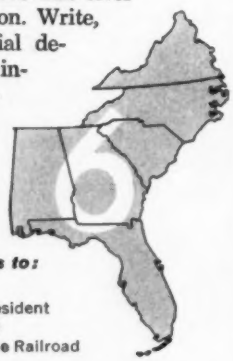
in the Southeast Coastal 6!

Want a river front site close to a major port? Then investigate this 1,500-acre plant site just nine miles north of Savannah, Georgia.

This tract has a 5,000-foot frontage on the Savannah River; 9-foot channel provides ready access to Savannah's port facilities. Site is also serviced by an Atlantic Coast Line mainline track and Georgia Highway 21. Ample power and natural gas available. Good labor supply—easily and quickly trained. Cooperative government; mild climate; excellent living conditions, recreational and educational facilities.

These and many more advantages make this river front site well worth your investigation. Write, wire, or phone Coast Line's industrial development specialists for details. All inquiries held confidential; no obligation, of course.

...serving the Southeast Coastal 6



ATLANTIC COAST LINE RAILROAD

Direct Inquiries to:
R. P. JOBB
Assistant Vice-President
Department K-50
Atlantic Coast Line Railroad
Wilmington, N. C.

ADMINISTRATION

KEY CHANGES

Henry S. Wingate to chairman of the board, **J. Roy Gordon** to president, **Ralph D. Parker** to senior vice-president, **Richard A. Cabell, Albert P. Gagnebin, Ralph H. Waddington** and **J. C. Parlee** to vice-presidents, the International Nickel Co. of Canada, Ltd., subsidiary of The International Nickel Co., Inc. (New York).

Walter Hochschild to chairman and chief executive officer and **Frank Coolbaugh** to president, American Metal Climax, Inc. (New York).

Reese H. Taylor to president, **Dudley Tower** to executive vice-president, **John W. Towler** and **N. T. Ugrin** to vice-presidents, Union Oil Co. of California (Los Angeles).

Guido F. Verbeck, Jr., to board of directors, The Carpenter Steel Co. (Reading, Pa.).

William F. Laporte to executive vice-president and **Kenneth A. Bonham** to vice-president, American Home Products Corp. (New York).

John N. Hart to vice-president, The B. F. Goodrich Co. (Akron).

George P. Bunn, Jr., to vice-president and **Harry D. Page** to secretary, Columbian Carbon Co. (New York).

Edward R. Adams, Andrew A. Farrell and **A. P. Gates** to vice-presidents, Virginia-Carolina Chemical Corp. (Richmond, Va.).

I. W. Keller to vice-president, Armstrong Cork Co. (Lancaster, Pa.).

Reginald L. Wakeman to vice-president and director, research and development, Onyx Chemical Corp. (Jersey City, N.J.).

Elliot H. Hartfort to vice-president, marketing, The A. S. Harrison Co. (South Norwalk, Conn.).

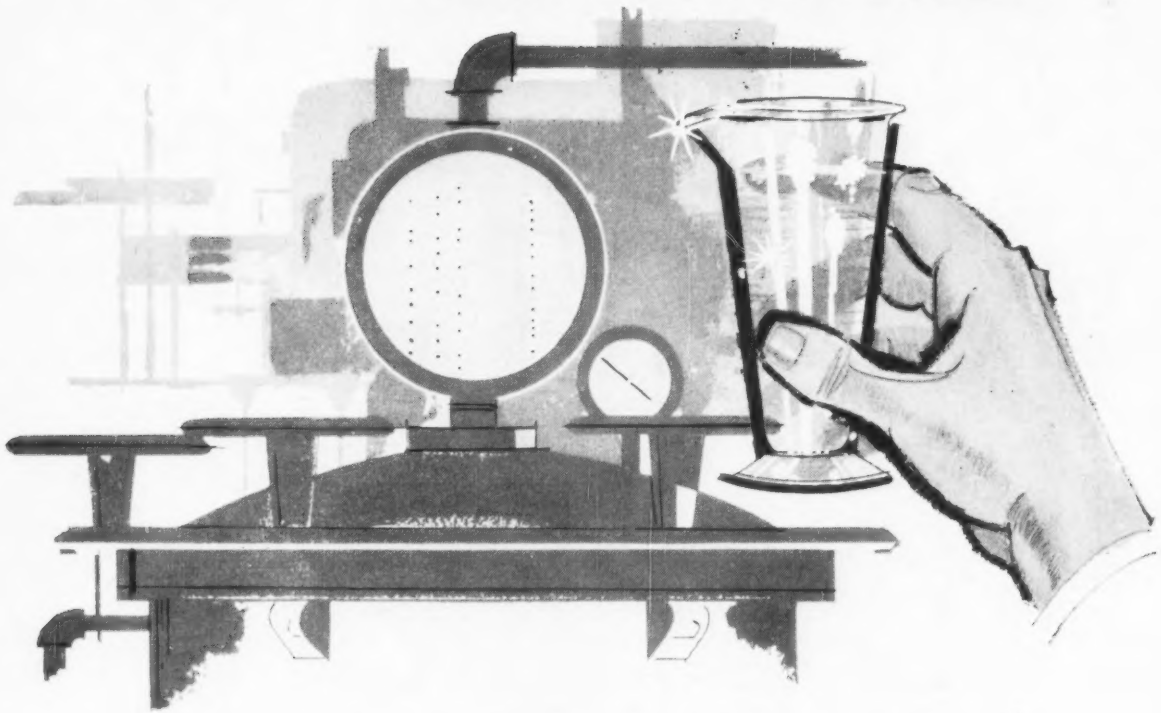
William G. Cole, Jr., to corporate vice-president, The Ferro Corp. (Cleveland).

William L. Rogers to vice-president, Azusa Plant, Aerojet-General Corp. (Azusa, Calif.).

Irving B. Polhemus to vice-president, Acme Resin Corp. (Chicago).

Harold A. Swanson to vice-president, Technical Products Division, E. F. Drew & Co., Inc. (New York).

New Standards of Filtration Control



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here's why:

Eagle-Picher's vast Nevada operations have made newly available *several million tons* of extremely high quality filter aid diatomite.

Exact grades are pin-pointed by "Strato-Test" field classification. Exceptional purity is ensured from the start.

A complete range of grades of filter aids are produced by Eagle-Picher in the world's newest, most efficient diatomite processing plant.

With this remarkable "on-grade" uniformity, you get precise control of clarity, at controlled flow rates.

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The Eagle-Picher Co., Dept. CW5-21, Cincinnati 1, Ohio

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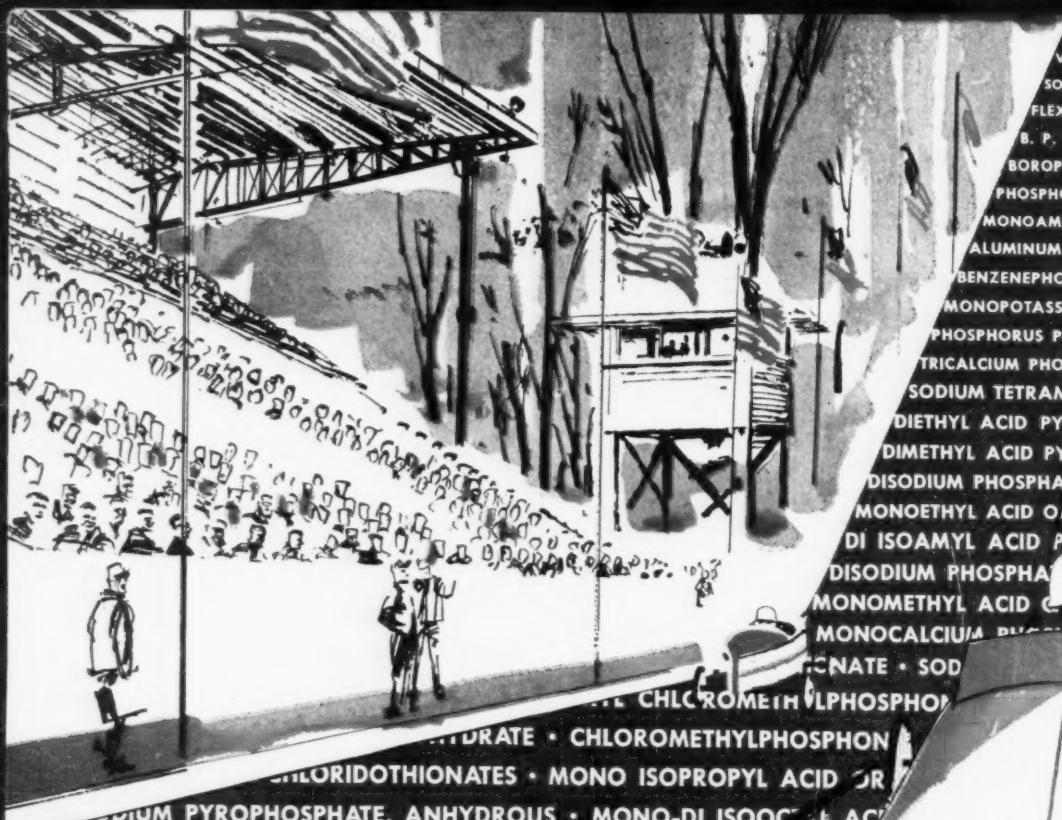
☐ Please submit sample_____ (size needed)
Type Product to be filtered

Filter-Aid to be used for:
☐ Primary filtering ☐ Pre-coat
☐ High clarity or polishing ☐ Admixture

NAME_____ TITLE_____

COMPANY_____

STREET_____ CITY_____ STATE_____



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MONOPOTASSIUM PHOSPHATE • POTASSIUM MET
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POTASSIUM METAPHOSPHATE • MONOMAGNESIUM PHOSPHATE • PHOSPHORUS PENTASULFIDE • PHOSPHORU
SODIUM HYPOSULFITE, NF • SODIUM IRON PYROPHOSPHATE • SODIUM ACID PYROPHOSPHATE • SODIUM
DIETHYL ACID PYROPHOSPHATE • DIBUTYL ACID PYROPHOSPHATE • CHLOROMETHYLPHOSPHONIC ACID •
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IT PAYS TO SEE
VICTOR

"Oxy" pushes performance

Whether you drive a compact car . . . conventional model . . . or homemade hot rod . . . gasoline performance is improved with the new additives. Most of these are produced with a chemical intermediate, such as Victor phosphorus oxychloride. Fuel performance is better . . . spark plug efficiency is increased . . . and engine endurance is noticeably improved.

Victor's phosphorus "oxy" and "tri" chlorides are amazingly versatile . . . serve as chlorinating agents in the preparation of intermediates and dyestuffs . . . play an active part in the manufacture of insecticides, pharmaceuticals and plasticizers.

If you're considering new chemical combinations for your products and are wondering how Victor phosphorus chlorides can help, here's an excellent intermediate step; use the coupon on the back page. Don't hesitate to request assistance from our technical service people. They'll be glad to show you why more than 40 industries say, "*It pays to see Victor.*"

Dical dooms decay . . .

Like the song says, "Her teeth are pearly pearly." And why not? She's shining them —just as millions of modern young maidens do—with a dentifrice that probably contains Victor dicalcium phosphate as the cleaning and polishing agent.

Whether it is a paste or powder, leading dentifrice manufacturers know "it pays to see Victor" for either dicalcium or tricalcium phosphates . . . that these pure, tasteless Victor phosphates were the first approved by the Council on Dental Therapeutics of the American Dental Association.

Where do Victor chemicals fit into *your* scheme of things? Of course, our technical service people will be glad to try to polish off one of your problems. Or if you prefer to put it in writing, just fill in the coupon on the back page. You will soon see why so many others say, "*It pays to see Victor.*"

DAP controls this bath . . .

This dyed-in-the-wool application demonstrates the point we want to make: namely, that a dye bath solution containing Victor diammonium phosphate is so dependable that even our "apprentice" here can control it.

As professional dye masters know, the most important part in dyeing natural fibers and synthetic worsted blends is a properly controlled bath. These experts know, too, that Victor diammonium phosphate maintains rigid *automatic* control of the dye bath—assuring maximum penetration, uniformity and levelness. All this plus a gradual increase in acidity that guarantees proper fixation and exhaust!

Next time you're faced with an exhausting problem, keep in mind that it may be resolved with the help of Victor chemicals. And don't be bashful about calling on our technical service people for a confidential consultation. If you don't wish to have a personal conference, just clip the coupon on the back page—it's the first step toward knowing why so many say, "*It pays to see Victor.*"

VICTOR CHEMICAL WORKS
Division of Stauffer Chemical Company
Box 271, Chicago 90, Illinois

☐ Please send samples of the following Victor chemicals:

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☐ Our company is in the ..... industry.
Please send your latest Victafile.

☐ We wish to have a discussion with a Victor representative. Please have him call for an appointment.

Name ..... Title .....

Company .....

Address .....

City ..... Zone .... State .....

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Division of Stauffer Chemical Company

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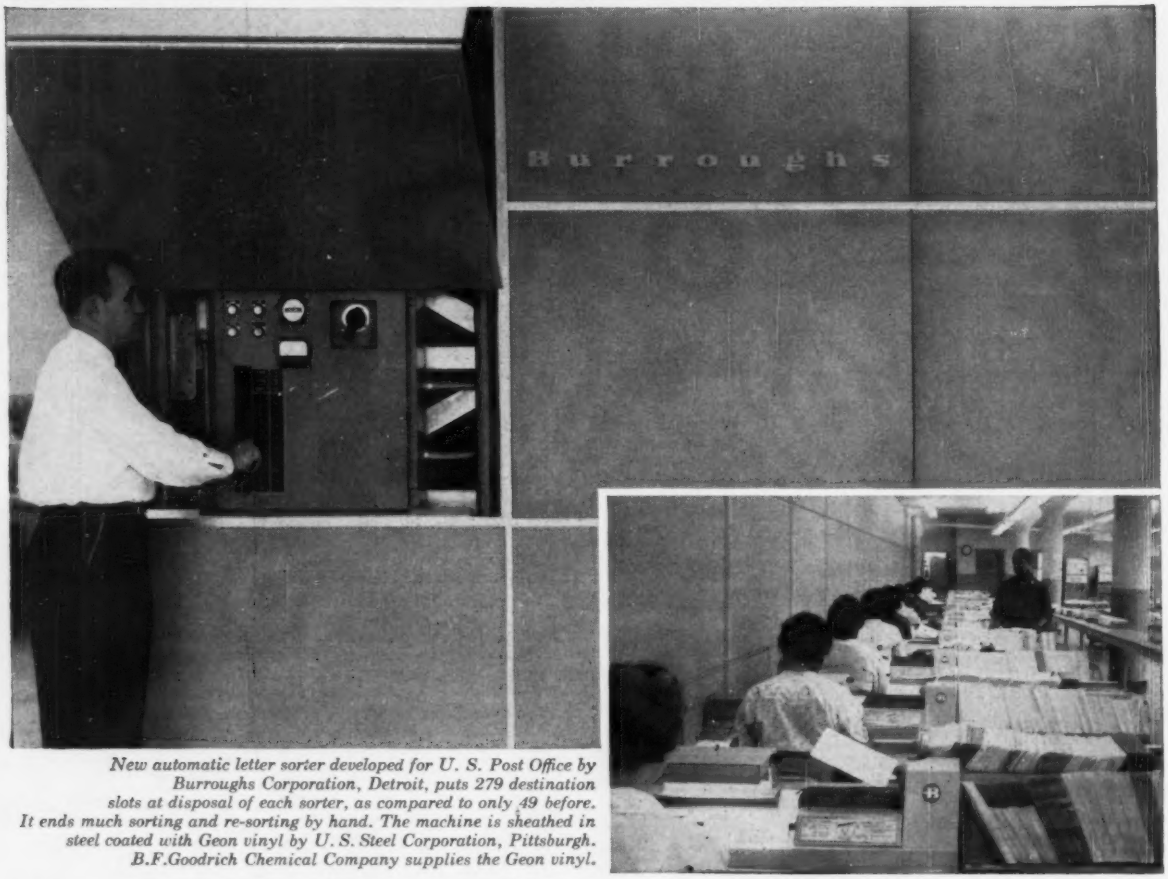
Another new development using

B.F.Goodrich Chemical *raw materials*



New automatic letter sorter developed for U. S. Post Office by Burroughs Corporation, Detroit, puts 279 destination slots at disposal of each sorter, as compared to only 49 before. It ends much sorting and re-sorting by hand. The machine is sheathed in steel coated with Geon vinyl by U. S. Steel Corporation, Pittsburgh. B.F.Goodrich Chemical Company supplies the Geon vinyl.

U.S. Mail sorting goes automatic

with new machine sheathed in steel coated with Geon vinyl

This new automatic mail sorter converts the age-old "peek and poke" hand method of sorting letters by destination to a smooth, 43,000 letters-per-hour sorting by machine. 78 feet long and 10 feet high, the machine is sheathed with a versatile new combination—steel coated with Geon vinyl.

The Geon coating provides a soft, pleasant look and feel. It can be washed. It won't scuff or stain. The color is permanent and the coating protects the steel against both wear and corrosion.

Geon-coated metals can be formed, bent, even projection-welded without damage to coatings. Products can be made to match the color combination or texture of almost any material.

Geon coatings also offer superior abrasion, electrical and chemical protection for the metal. It's another example of the way that versatile Geon is improving products and opening new markets. For more information, write Dept. GH-4, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

Geon VINYLS

B.F.Goodrich Chemical Company
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GEON vinyls • HYCAR rubber and latex • GOOD-RITE chemicals and plasticizers

Titanium Wins Steel Backing

This week in Dallas, Tex., F. W. Glitsch and Sons, Inc., is preparing chemical process equipment bids unlike any that have been made before. They're the first bids based on Titanium Metal Corp. of America's new technique for welding titanium to steel —a development that could be decisive in helping titanium make the grade as a major chemical construction material.

The technique, which uses vanadium as a compatible layer between the titanium and steel (*see diagram, right*), sidesteps the usual problems of welding dissimilar metals. It simplifies welding in the field, permits the use of standard welding procedures. It also permits the use of thin sheets —0.010 in. or thinner (e.g., for wet chlorine atmosphere)—that cut the cost of lining material to below $4/sq.ft. (*see table, p. 62*).

These advantages make titanium lining of vessels and ducts an attractive possibility. Until now, even with titanium prices declining (*see table, p. 62*), titanium equipment costs have been more than double those of stainless steel. Equipment made entirely of titanium is beyond the reach of many chemical companies.

And techniques for cladding steel with thin sheets of titanium remain costly shop jobs or are still in the experimental stage. Ultrasonic welding, which might eventually overcome many problems of welding dissimilar metals (*CW, Dec. 20, '58, p. 65*) is still a long way off for titanium. This method requires costly welding equipment, is limited to very thin gauges of metals.

The problems of welding titanium to steel are similar to those of joining other dissimilar metals—with an added complication. In welding any dissimilar metals (e.g., stainless steel to carbon steel, or to other types of stainless), dilution of the base metal (iron pickup) must be minimized to prevent corrosion. And compounds that cause weak, brittle welds must be kept from forming. But, because titanium is highly reactive (it readily combines with nitrogen and oxygen), air must be kept from the weld. This requires the additional precaution of an inert welding atmosphere.

Question of Compatibility: Two members of TMCA's technical department came up with the answer to the titanium-steel welding problem about a year ago during a chance discussion while on their way to Connecticut to make a proposal for use of titanium in submarines. The solution seemed simple enough—Why not use a metal that is compatible with both titanium and steel as a layer between the two?

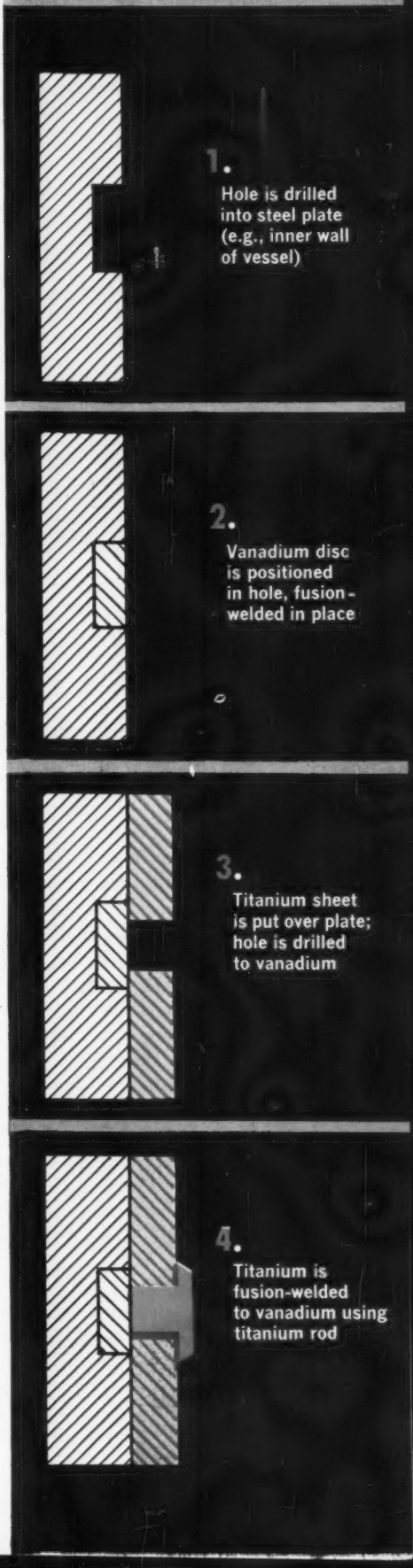
For example, nickel is sometimes used as a "butter" between stainless and ordinary steels. Silver has been used in the joining of aluminum to steel, and as an inlay for a titanium strap joint in Chicago Bridge & Iron's vacuum-brazing (Hortonclad) process for titanium cladding (*CW, April 13, '57, p. 34*).

A compatible metal not only would solve ordinary dissimilar-metal welding problems but also would minimize the problem of inert-atmosphere protection. For example, in lining vessels with titanium sheet using fusion-welding techniques, no protective atmosphere is required behind the weld point. Here's how it's done: A hole is drilled part way through the steel shell of the vessel and a plug of the compatible metal is welded into place. Only a small protective cap is required when the titanium sheet is welded to the compatible metal using a titanium filler rod. Protection of this type could be easily provided using an automatic welding gun with an inert-gas diffuser, such as the type developed by Griscom-Russell.

TMCA's product development group set about evaluating compatible materials, found vanadium to be the best. Silver provides too weak a bond, requires a strapping technique such as CB&I's to be effective. Molybdenum forms a brittle weld.

Vanadium's only drawback, cost, did not prove to be a major factor, since quantities used in welding are small. For example, a vanadium plug used in fusion welding costs only about 30¢. In spot or seam welding, vanadium foil can be used. And no

How titanium can be welded to steel


1.
Hole is drilled into steel plate (e.g., inner wall of vessel)
2.
Vanadium disc is positioned in hole, fusion-welded in place
3.
Titanium sheet is put over plate; hole is drilled to vanadium
4.
Titanium is fusion-welded to vanadium using titanium rod

Problem:

To speed up pepper grinding without losing volatile oils

Solution:

SPROUT-WALDRON
ROLLER MILLS

To grind pepper to −40 mesh at production rates from 2-3000 pounds per hour without generating excessive heat or causing unnecessary loss of volatile oils, Durkee Famous Foods, Bethlehem, Penna., installed a Sprout-Waldron pepper grinding system.

Heart of the system is the one-point control double roller mill. Design of this unit permits operator to set and align rolls with complete accuracy in a matter of seconds. The higher the production requirements, the more important is this one-point control feature.

For full details on the Durkee system, ask for Pointers, Vol. 2 No. 5. For specifications on the roller mill request Bulletin 153-A.

CW/109

SW SPROUT-WALDRON
Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

Costs of titanium flat-rolled stock

Thickness	$/sq.ft.*
¼ in. (plate)	$42.50
⅛ in. (sheet)	24.25
1/16 in. "	12.75
0.050 in. "	11.10
0.032 in. "	7.50
0.025 in. "	6.20
0.010 in. (strip)	3.96
0.005 in. "	3.93

* Prices are based on 1,500-lb. order, include extra costs for thickness and width.

Prices of titanium sponge and mill products

	Mill Products		Sponge ($/lb.)
April 24, 1954	$15.25	1949-1954	$5.00
April 1, 1955	14.25	April 1, 1954	4.72
Nov. 23, 1955	13.41	Dec. 1, 1954	4.50
May 15, 1956	12.59	April 1, 1955	3.95
Dec. 3, 1956	11.75	Nov. 1, 1955	3.75
June 3, 1957	10.55	Nov. 23, 1955	3.45
April 23, 1958	9.25	May 15, 1956	3.25
Nov. 28, 1958	8.66	August 1, 1956	3.00
Jan. 1, 1959	7.77	Dec. 3, 1956	2.75'
May 19, 1959	7.59	June 3, 1957	2.25
Dec. 9, 1959	7.22	April 1, 1958	2.05
Feb. 1, 1960	6.97	Oct. 1, 1958	1.82
		August 1, 1959	1.60

TMCA Composite Index, based on commercially pure (unalloyed) sheet and strip, and alloy bar and billet, plus applicable price extras.

protective atmosphere is needed when spot-welding techniques are used.

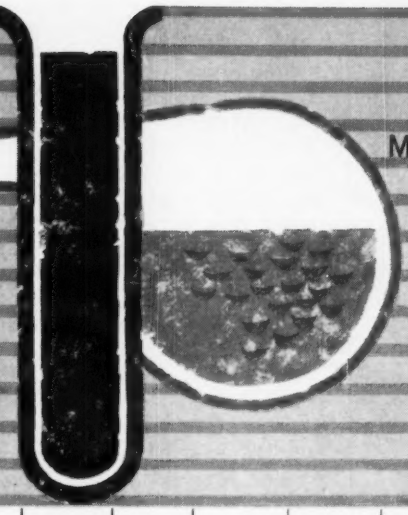
Many Possibilities: Now that TMCA is certain there are no major problems with the basic technique, which it calls interlayer welding, it is ready to turn the practical developments over to equipment fabricators. So far, only Glitsch has carried through with refinements, is actively seeking chemical industry fabrication jobs. Likely candidates: chlorine dioxide handling in the pulp and paper industry; basic chlorine production. (Titanium exhibits a negligible corrosion rate in wet chlorine; lining material as thin as 0.002 in. might be used.)

A few other fabricators are taking a wait-and-see approach. One of the problems they raise: weld ductility may be questionable. And the only way to check ductility properly

EFFECTIVE

Pfizer

CHEMICALS FOR METAL FINISHING



PLATING
DE-RUSTING
METAL CLEANING
ALUMINUM
ETCHING AND
COLORING

	Cleaning	Polishing	Pickling	Electroplating	Electropolishing	Non-Electrolytic Depositions	Electrolytic Oxidation	Etching	Gold Coloring of Aluminum
Citric Acid	✓	✓	✓	✓	✓	✓	✓	✓	
Sodium Citrate	✓	✓		✓		✓			
Ammonium Citrate	✓	✓	✓	✓					
Gluconic Acid	✓	✓	✓	✓				✓	
Glucono Delta Lactone	✓	✓	✓	✓				✓	
Sodium Gluconate	✓	✓		✓				✓	
Oxalic Acid	✓	✓	✓	✓	✓		✓	✓	
Ammonium Oxalate	✓	✓		✓					
Ferric Ammonium Oxalate									✓
Tartaric Acid	✓		✓	✓				✓	
Tartar Emetic				✓					
Rochelle Salt			✓	✓					
Cream of Tartar	✓			✓					

Citric Acid...
Nontoxic, mild, yet chemically active against scale and tarnish. Used extensively in the formulation of general metal cleaners and polishes, particularly household products.

Sodium Citrate...
A preferred ingredient in electroless nickel baths, resulting in a brighter plate. Also finds wide use in electroplating processes.

Ammonium Citrate...
Especially useful for the removal of rust in near neutral solutions. Extremely mild and safe to handle.

Gluconic Acid...
An excellent sequesterant in alkaline derusting solutions; provides rust-free, clean surface ready for further treatment. Also highly effective in aluminum etching and paint stripping compounds.

Oxalic Acid...
The most effective chemical for use in automobile radiator cleaners. Also finds wide use in electropolishing and as an ingredient in general metal cleaners.

Ferric Ammonium Oxalate...
Used extensively in the production of light-fast gold colored aluminum.

Tartaric Acid...
Excellent complexing agent for copper in electroplating.

Tartar Emetic...
Used in electrolytic baths for deposition of silver and antimony alloys on brass, copper and steel surfaces.

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Increases efficiency and yields finer-grain deposit in alkaline copper plating.

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An excellent additive for brass cleaning compounds. Its crystalline structure acts as an effective abrasive in paste polishes. Chemically active against tarnish.

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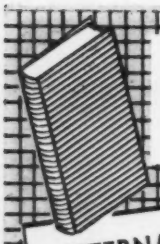

New Books to Help in Your Work

INTERNATIONAL SYMPOSIUM ON HIGH TEMPERATURE TECHNOLOGY

Just Published—Presents important findings by top specialists in high temperature research. Image furnace research; high intensity electrical discharges; refractory metals are among many topics covered. **By Stanford Research Institute. 348 pp., 240 illus., $15.00**

CHEMICAL ANALYSIS

Just Published. Covers the basic principles underlying chemical methods of analysis. Special emphasis is placed on equilibria, kinetics, and the mechanisms of the important types of chemical reactions. Also emphasized are methods of separation and the application of statistical methods to sampling, experiment design, and interpretation of results. **By Herbert A. Laitinen, University of Illinois. 600 pp., 69 illus., $12.50**

PETROLEUM PRODUCTS HANDBOOK

Just Published—Covers properties, characteristics, performance of all types of petroleum products. Gives facts and data for best results in supplying, handling, transporting, storing, and using them. Includes fuels, lubricants, additives, asphalts, waxes, coke, and others. **Edited by V. B. Guthrie, formerly Ed., Petroleum Processing, and Mng. Ed., National Petroleum News, 864 pp., 459 illus., $18.50**

ELECTROCHEMICAL ENGINEERING

Just Published — Fourth Edition. Fully covers industrial electrochemistry with emphasis on the practical manufacturing aspects of the electrochemical processes. Explains the best modern methods in electrochemical analysis; electroplating and electroforming; electrorefining; electrowinning; electrolysis; and electrothermics. **By C. L. Mantell. Consulting Chemical Engineer, 4th Ed., 715 pp., illus., $16.50**

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PRODUCTION

is by destructive testing. This means they'll probably wait until extensive field tests have been run.

Another problem is high-temperature service. Steel expansion rates are about double those of titanium, which would seem to rule out the welding technique at temperatures much higher than 250 F. And one fabricator points out that titanium's main advantage is in high-pressure, high-temperature processing.

One chemical company feels that the interlayer welding method wouldn't have any real advantages over the loose lining of vessels as done by Pfaudler. Vessel liners as thin as 0.040 in. have been successfully put into place by Pfaudler. But a much thinner liner of the type suggested by TMCA would cost only about one-half as much per square foot of metal (*see table p. 62*).

And a thin loose liner for a large vessel would present field installation problems. Also, loose liners would collapse in vacuum service.

In addition to field fabrication, the interlayer welding technique can be used to attach titanium sheet to a steel plate before it is formed into a finished shape in a fabricator's shop.

New Focus on Cost: One thing that the interlayer welding technique will do is to focus attention on a new cost area for the potential titanium purchaser. In the past, titanium producers have had to stress that the high cost per pound doesn't give an accurate picture because only 60% as much titanium on a weight basis gives strength equal to stainless steel's. With thin liners, where coverage is the important factor, it's simple to figure costs per square foot for sheets of any thickness, get a good idea of how much the liner costs. Actual fabrication costs will depend on the amount of welding that must be done; however, costs probably won't be too far out of line with those for ordinary welding jobs once experience has been gained with the interlayer technique.

Although TMCA won't discuss what might happen to titanium sheet and strip prices if the new welding technique catches on, they're easy to figure, if based on the current price structure. For example, a 1,500-lb. order of 0.010-in. strip would cost $3.96/sq.ft.; a 2,100-lb. order of strip would cost $3.81/sq.ft.

Better Prices: Since titanium prices in general have dropped consistently over the last six years, titanium equipment costs are steadily growing more attractive. For example, Pfaudler says that titanium heat exchangers can now be built for only a little more than twice the cost of stainless exchangers. A year ago, the cost was closer to three times that of stainless.

In addition to the brightening cost picture, fabricators and chemical companies are anxiously awaiting commercial availability of the titanium-palladium alloy introduced by Union Carbide Metals last year (*CW, April 18, '59, p. 76*). Sample quantities have been produced and examined by a number of firms. The obvious advantage of the alloy: corrosion protection in both oxidizing and reducing environments at only slightly higher cost than commercially pure titanium that can now be used only in oxidizing environments.

TMCA's new interlayer welding technique is new evidence that titanium is rapidly overcoming its long-standing growing pains.

EQUIPMENT

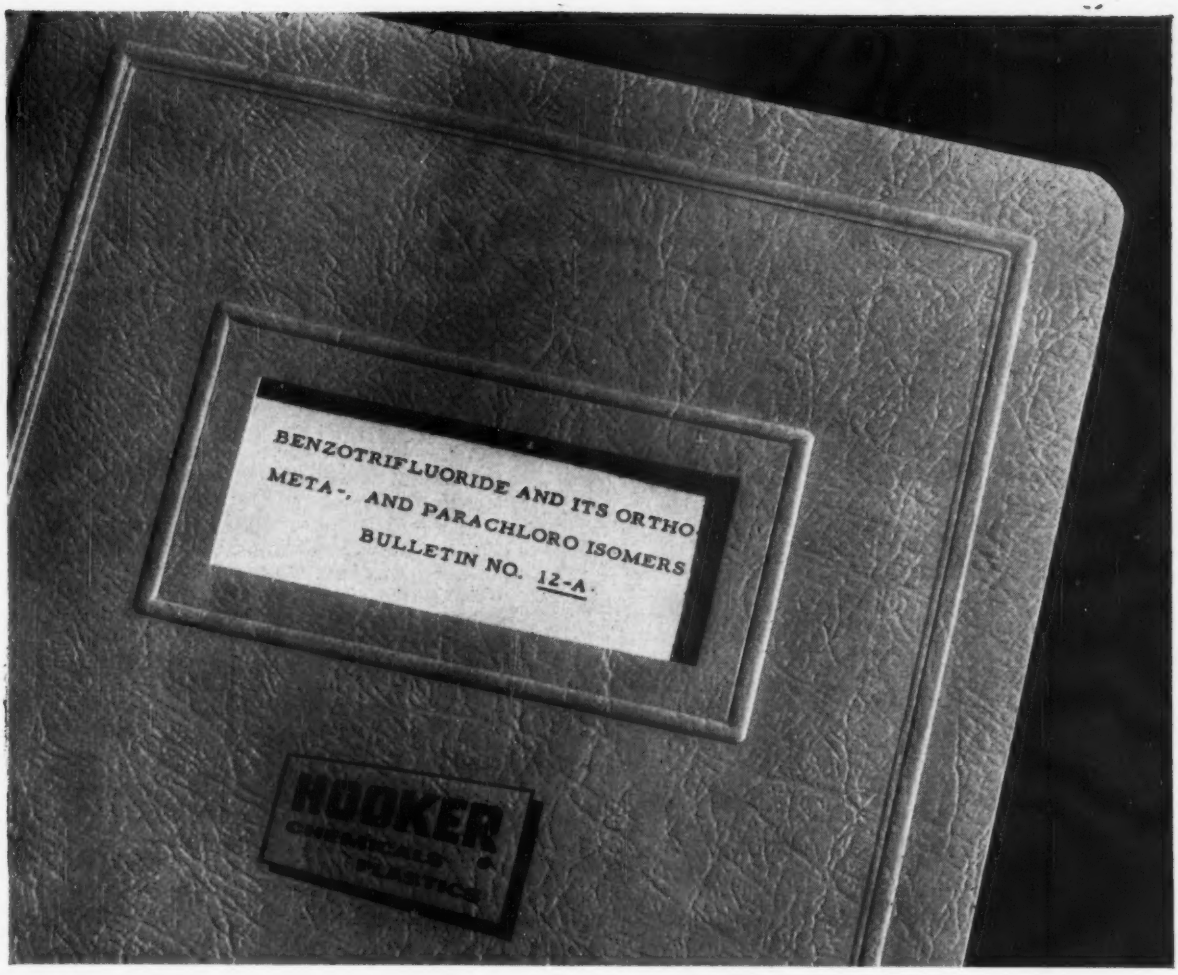
Hydrogen Sulfide Remover: Connor Engineering Corp. (Danbury, Conn.) has a new, canister-type purifier that removes hydrogen sulfide from the atmosphere. The Dorex Type H 42 canister uses a specially impregnated form of activated carbon that retains up to 30% of the gas—as much as 10 times that of other purifiers. It's for use in plants where hydrogen sulfide odor is a problem—e.g., in paper mills, refineries.

•

High-Temperature Control: United Electric Controls Co. (85 School St., Watertown 72, Mass.) is offering a new, compact, remote-bulb temperature controller for ovens and other heating equipment in the 100 to 1000 F range. The unit may be set to control and indicate temperatures anywhere within scale limits. The controller operates on 15- or 20-amp., 115- and 230-v. ac.

•

Solenoid Valve: Atkomatic Valve Co. (545 West Abbott St., Indianapolis) is marketing a new 1500 series solenoid valve, featuring direct lift action and full-ported construction, which minimizes pressure drop



WRITE FOR THIS LATEST DATA FILE ON BENZOTRIFLUORIDES

Here is the latest compilation of facts about Benzotrifluoride and its Ortho-, Meta-, and Parachloro Isomers now produced in commercial quantities by Hooker.

This information (a dozen pages of it) covers physical properties, chemical properties and scores of applications ranging from a lampricide intermediate to pharmaceutical and dye intermediates.

If you'd like to bring your files up to date and give yourself a fast review of the properties and uses of the Benzotrifluorides, write for a free copy of this data file.

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Please send me a free copy of Bulletin 12-A, *Benzotrifluoride and its Ortho-, Meta-, and Parachloro Isomers.*

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HOOKER CHEMICALS PLASTICS

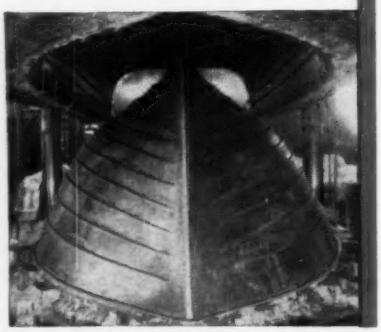
news briefs...

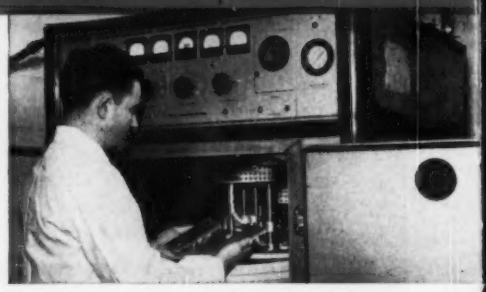
ON THE CREATIVE USE OF M&C PROCESS MATERIALS

*Molded Plastic boats gain strength and beauty from ASP® fillers

Popularity of reinforced plastic boat hulls is due to their low maintenance requirements, dependable strength, and beautifully smooth surfaces. Physical strength and smoothness come not just from the resin and fibrous glass reinforcement—top performance is built in by the right filler. M & C's ASP aluminum silicate pigments, used at high loadings, absorb the exotherm, reduce peak temperatures and shrinkage, eliminate cracking and crazing. The uniformly smooth surface doesn't need paint, thanks to the ASP's fiber hiding job. Find out what the ASP's will do for *your* moldings... this is a *starred* item . . . use the coupon.

Illustrations courtesy of Molded Fiber Glass Boat Company, Union City, Penna. These lapstrake-type fiber glass hulls are made in matched metal dies. MFG makes 13, 15 and 17-ft. models.





M & C paint chemist checks condition of painted masonry samples from Weather-Ometer unit in Menlo Park, N.J., Research Center. Outside paints are also tested on test fences.

Outside Latex paints with ASP 400 show less chalking, better viscosity stability, superior color retention

Water-based latex paints, having revolutionized indoor painting, are now moving outdoors. The trend shows more and more latex paints will be used outside—over wood, masonry, and metal. The ability of latex paints to withstand exterior exposure depends greatly on the characteristics of their extender pigments. Extensive performance tests by M & C of available extenders in 5 major types of outside latex paints have shown that:

1. ASP 400 is definitely superior to other types of extenders in viscosity stability.

2. Use of ASP 400 leads to almost total absence of staining and water spotting in exterior paint film.

3. ASP 400 is superior to all other types of extenders tested in providing a lesser, more desirable degree of chalking.

4. In the range of 25 to 35 PVC, where quality paints are formulated, ASP 400, in combination with diatomaceous silica, shows least dirt collection.

5. In white or colored exterior latex paints, ASP 400 has proven to be the best all-around extender.

Technical Data Sheet #209 gives all the data . . . use the coupon for your copy.

Minerals & Chemicals Corporation

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Leaders in the creative use of non-metallic minerals

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*Adhesives get fast wet tack, speedy adhesion with ASP's

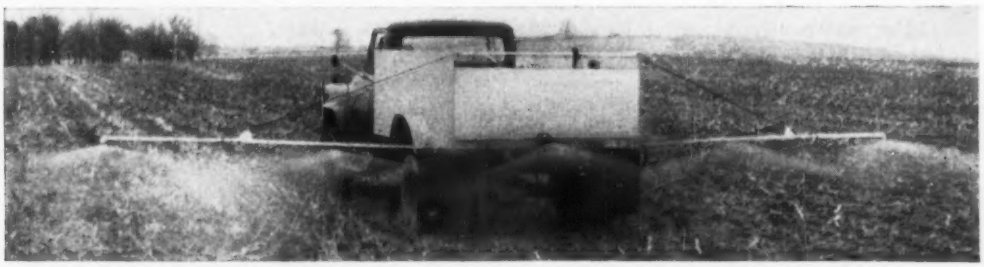
You're looking at one of the "tackier" adhesives developed with M & C's ASP aluminum silicate pigments in the formulation. According to Morningstar-Paisley, Inc., one of the country's best known adhesive manufacturers, ASP's are the answer to a long standing adhesive industry problem. "For years," they report, "the adhesives industry has been looking for a clay type compounding ingredient without the usual defects of poor color, excessive tendency to separate, poor dispersibility and non-uniform particle size. In ASP's we have found such an ingredient."

Morningstar-Paisley uses ASP's in many of its modified polyvinyl adhesives to gain increased wet tack, speed of adhesion, freedom from settling and good color properties. If you make adhesives to be used in the manufacture of paper tubes, folding boxes, laminates—or other demanding applications—you too can benefit from M & C aluminum silicate pigments. Investigate . . . this is a *starred* item . . . check and mail the coupon.

Liquid Fertilizers suspend more nutrients, get top uniformity, with ATTAGEL 30

Farmers sprayed over one-half million tons of liquid fertilizer in the 1957-1958 season . . . and the market for mixed fertilizers in liquid form is growing fast. The use of M & C's ATTAGEL 30 as the suspending agent is an important factor in increasing the versatility of this relatively new fertilizing technique. Limits in the solubility of salts and other ingredients set a ceiling on the maximum analysis that fertilizer manufacturers could obtain and still maintain a uniform product. Now, in most cases only 1 to 3 per cent of ATTAGEL 30—colloidal grade attapulgite developed at the M & C Research Laboratory—is sufficient to stabilize and maintain a rich liquid fertilizer. ATTAGEL 30 also makes possible the addition of trace elements, insecticides and herbicides.

Investigate this low cost fine dry powder . . . use the coupon.



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For more data, see your 1960 Chemical Materials Catalog, pages 451-458

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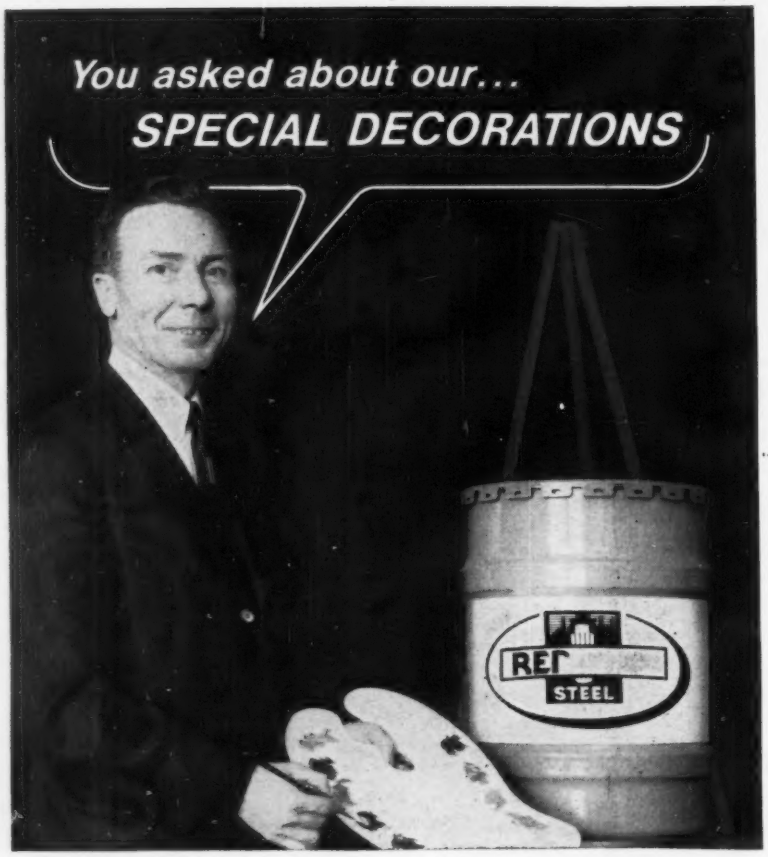

Here's Republic Container salesman Charley Barker to tell you all about it

"I'm not really painting this drum at all," says Charley Barker, Republic salesman working out of Niles, Ohio, "but that doesn't mean I can't supply my customers with painted or decorated drums and pails to meet their requirements.

"To tell the honest truth, our plant can supply drums and pails in any combination of colors. Our lithography, printing, painting, and design facilities can help customers develop and apply outstanding designs economically.

"While I'm on the subject, I would just like to vouch for something I feel deeply—that people should always insist on Republic Containers. We make a complete line of Universal Standard Drums and Packages, as well as many other sizes and types, from 3½-gallon upward in the gage steel required to do the job."

REPUBLIC STEEL

CONTAINER DIVISION • 565 Walnut Street • Niles, Ohio

This STEELMARK of the American Steel Industry is your assurance that a product is made of steel.

PRODUCTION

and other flow problems at pressures from 0 to 1,500 psi. and temperatures from —350 F to 450 F. The valves are bubble-tight, leakproof and packless. They're available in bronze and stainless steel in ¼-in. to 1-in. sizes.

•

Vibrating Mill: Allis-Chalmers (Milwaukee 1, Wis.) claims its new, 30-in. vibrating mill, powered by two 50-hp. motors, can outproduce a tumbling mill by 15-30 times per unit volume. It has an initial cost one-third lower than that of any machine of comparable capacity. The unit occupies 66 sq.ft., has an internal volume of 12 cu.ft. It's for continuous processing of a wide range of materials.

•

Radioactivity Kit: Tracerlab Co. (1601 Trapelo Rd., Waltham 54. Mass.) is offering a new emergency decontamination kit for radioactive spills. The Decon-Kit provides both the equipment and instruction necessary to take immediate corrective action during the first critical moments following discovery of a spill. Cost: $190 f.o.b.

•

Metal Bender: A new, portable bending tool from Hahn Co. (2311 Fox Hills Dr., Los Angeles 64) can be used to bend and form wire and sheet metal up to ⅛ in. thick, 1¼ in. wide. Held in the hand or clamped in a vise, the bender exerts up to 2,000 lbs. of pressure against angle and curve dies, can be used for cold-rolled steel, aluminum, brass and copper. Price: $4.95.

•

Pocket Radio: General Electric Co.'s Communication Products Dept. (Lynchburg, Va.) says its new, 12-oz., all-transistorized shirt-pocket radio receiver requires 35% less stand-by battery power than other radios of this type. The user clips the Voice Director's speaker onto his collar.

•

Mass Flowmeter: Black, Sivalls & Bryson, Inc. (7500 E. 12th St., Kansas City 26, Mo.), has new mass flowmeter models that measure directly in pounds of ethylene, natural- and industrial-gas flows. The meter consists of a constant speed impeller and a stationary turbine arranged for axial flow. A small gyroscope permits output to be continuously recorded.

TEP

Eastman Triethyl Phosphate

If you have need of

a non-corrosive solvent	Eastman triethyl phosphate is completely miscible with water, ethyl alcohol, acetone, ethyl acetate, chloroform, benzene, xylene, castor oil and isobutyl alcohol and partially soluble in mineral oil, kerosene, gasoline, ethyl ether and carbon disulfide. It shows promise as an ingredient in functional fluids and as a dyeing assistant.
a mild ethylating agent	Triethyl phosphate may be the answer to your search for an ethylating agent. It has been used, for example, in the preparation of N,N-diethyl aromatic amines, and in synthesizing ethyl ethers of higher aliphatic alcohols.
a starting material for pesticides	Triethyl phosphate is used to manufacture tetraethyl pyrophosphate (TEPP), a powerful, fast-acting insecticide which hydrolyzes within 48 hours to a harmless residue. TEPP is particularly valuable for early-season or harvest-time application.
a catalyst for specific reactions	Triethyl phosphate is useful as a catalyst in the dehydration of glycols and olefinic alcohols, in the synthesis of esters, and in the polymerization of such monomers as coumarone, styrene, cashew nut oil and tung oil.
a wax-free, water soluble, low-cost lacquer remover NEW	Here's something to look into. An unusual lacquer remover effective for cellulosic, vinyl and acrylic lacquers, and for air-dried enamels can be formulated with Eastman triethyl phosphate. The lacquer remover requires no wax, softens yet does not dissolve the film, holds well on vertical surfaces, and is non-flammable. The softened film can be readily removed by flushing with water.

If you would like more information on the use of Eastman triethyl phosphate in any of these applications, please write to

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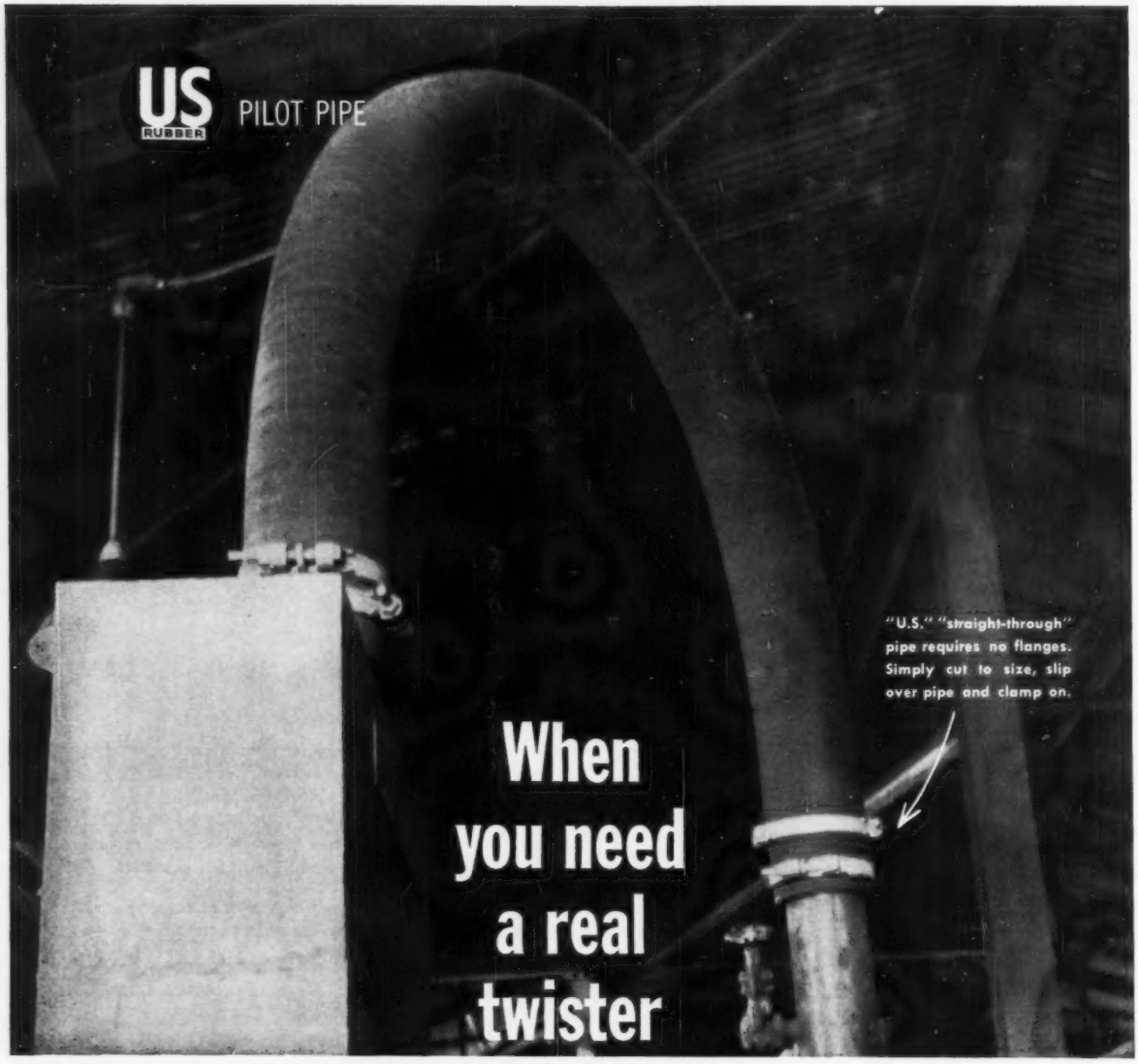
SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; Atlanta; Chicago; Cincinnati; Cleveland; Detroit; Framingham, Massachusetts; Greensboro, North Carolina; Houston; New York City; Philadelphia; St. Louis. **West Coast:** Wilson & Geo. Meyer & Company, San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.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PILOT PIPE
"U.S." "straight-through" pipe requires no flanges. Simply cut to size, slip over pipe and clamp on.
When you need a real twister

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This limber, highly abrasive-resistant U. S. Pilot® Pipe is at work 7 days a week, 24 hours a day (during the 6-month concentrating season) in the heavy media department of the beneficiation plant of a large iron ore producer. It carries 200 gallons per minute of ferro silicon into a magnetic separator.

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- Pilot Pipe is so flexible it permits an easily formed angle, eliminating need for elbows (the smooth flow reduces points of turbulence) hence it takes up less room, requires less plumbing.

U. S. Pilot Pipe includes a wide range of designs ("straight-through", duck and rubber flanges, swivel flanges) that handle a wide range of working pressures—from 25 to 250 pounds—and also handle a wide range of chemicals and abrasives.

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Technology
Newsletter

CHEMICAL WEEK
May 21, 1960

A new vinyl dichloride plastic, hi-temp Geon, was launched by B. F. Goodrich Chemical this week as a potentially strong competitor of copper and galvanized piping. The new Geon is currently being produced in developmental quantities at the company's Avon Lake, O., pilot plant; commercial production facilities are expected to be completed next year.

Outstanding property of the compound: a 60-degree higher temperature rating than that of conventional vinyl plastics. In laboratory tests, vinyl dichloride piping withstood 200 F at 150 psi., also remained unaffected by immersion in hot sulfuric acid (at 185 F) for 30 days. BFGC expected that a market for "many millions of pounds" will develop in a short time. Hi-temp Geon piping weighs only one-sixth as much as copper, will likely sell at a slightly lower price.

•

Fiber-reinforced metal will be one answer to increasing temperature-resistance problems, according to Horizons Inc. (Cleveland). Although it's still experimenting with optimum fiber-to-metal ratios and fiber dimensions, as well as bonding techniques and fabrication methods, Horizons reports that addition of high-strength ceramic fibers permits metals and alloys to maintain much of their strength at near-melting-point temperatures. Also, total weight is less, which gives a more favorable strength-to-weight ratio.

Choice of the metal is limited by two qualifications: it must maintain oxidation resistance close to its melting point and it must be completely free of precipitation phases. The fiber, on the other hand, must have the following properties (compared with the metal): lower density, higher melting point, equal or lower coefficient of expansion, higher elastic tension modulus and much greater high-temperature strength. One suitable combination: an alloy of 80% nickel and 20% chromium, fiber of single-crystal aluminum oxide.

•

A new urethane foam that's stable at 450 F and serves as an ablation material at higher temperatures is a result of isocyanates research at Carwin Co. (New Haven, Conn.). Polymethylene polyphenyl isocyanate, developed by Carwin, is the key to the unusual properties of the new foam, called Carthane 1008 Infusible Foam. Most urethanes fail rapidly at 250-300 F; the "high-temperature plastic" range starts at about 500 F (*CW, March 12, p. 57*).

Flameproofing of urethane foams is described by Mobay Chemical Co. (Pittsburgh) in another urethane development. Mobay reports that tris-(β-chloroethyl) phosphate, when added to a "one-shot" polyether system based on polypropylene ether triol, renders it "appreciably" less flammable, even completely self-extinguishing.

Technology

Newsletter

(Continued)

Ethyl Corp. last week added trimethyl phosphate to its line of ignition control additives for gasoline. The newcomer, tradenamed Ethyl Ignition Control Compound 4, is said to provide more phosphorus per pound, at a lower cost per pound, than any comparable additive. Extensive testing of ICC 4 indicates that it may increase spark-plug life by a factor of 3-3½, reduce surface ignition 70-80% and greatly reduce engine rumble. Ethyl also estimates that in the first year of use ICC4 will provide savings of 10-15% over competitive phosphorus additives that are relatively more soluble in the water accumulating in gasoline storage tanks.

•

Newest semiconductor material to bid for thermoelectric cooling use is Neelium—reportedly the first quaternary alloy in commercial production. It's a combination of bismuth, tellurium, selenium and antimony, is produced by General Thermoelectric Corp. (Princeton, N. J.), a newly formed joint subsidiary of General Devices, Inc., and Needco Cooling Semiconductors, Ltd. (Montreal).

Needco President Roman Post pegged a British-developed production technique as the key to Neelium's high efficiency and low cost. The process—described only as "atomization"—is said to yield better thermoelectric properties, with production costs as much as 10 times lower than those of zone melting. A pilot plant is now operating full-scale; mass production is scheduled to begin in June. First application: a subminiature Frigistor, a device incorporating eight Neelium thermocouples for cooling solid-state electronic devices such as transistors, diodes and rectifiers.

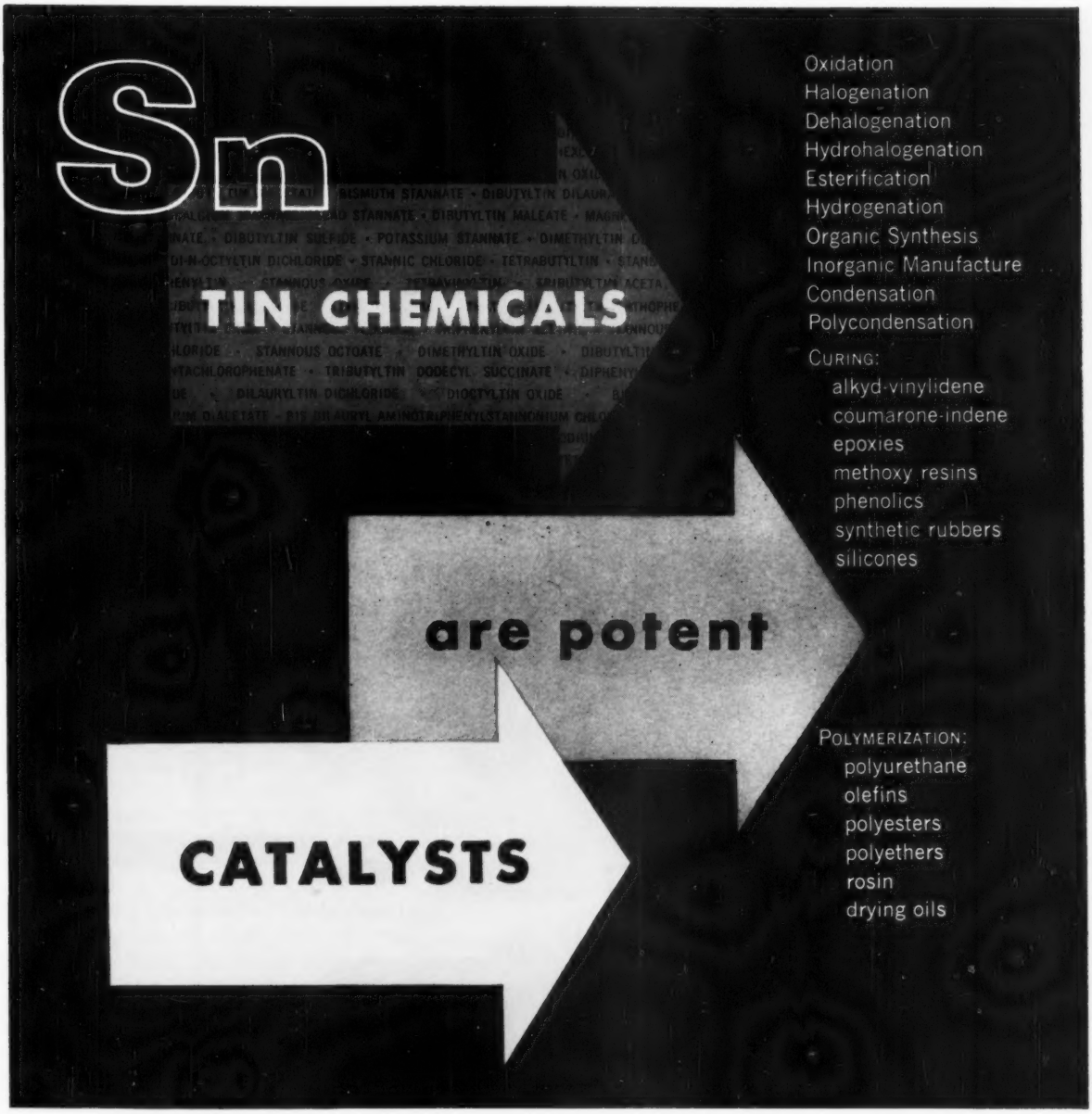
•

An improved ion propulsion system was proposed last week to a Los Angeles meeting of the American Rocket Society by two Lockheed scientists. Sidney Kash and M. A. Gilleo, of the company's missiles and space division (Sunnyvale, Calif.), hold that negative ions are as easy to produce as positive ones, and that using both kinds offers a number of advantages to an ion propulsion system.

Most ion systems now under study utilize only positive ions (usually cesium), require an accompanying electron stream to neutralize any buildup of charge behind the vessel. Advantages Lockheed sees for replacing the electrons with negative ions: greater thrust resulting from the added mass, easier matching of the velocities of the two streams, greater efficiency, more compact accelerator, more stable propellants.

•

Progress in protecting living cells against radiation sickness has been reported by researchers at Argonne National Laboratory (Argonne, Ill.). Argonne worked with sulfhydryl (SH) compounds and dry bacterial spores, found that sulfhydryls (e.g., cysteine, found in living tissue) reduce the concentration of radiation-induced oxygen and free radicals that cause cell damage.



Making reactions really GO is a job particularly well done by tin chemicals in dozens of commercial applications. Our recently completed *patent and literature survey on catalytic applications of tin chemicals* will undoubtedly suggest many more to development men.

A wide variety of inorganic and organic tin chemicals are available from M&T. Catalytic application possibilities for organotins are greatly broadened by their solubility in many organic solvents and their volatility in vapor systems.

If you are interested in new catalysts, request our new *patent and literature survey.* M&T will then be glad to supply samples and further information based on your specific development interest.

See our insert in Chemical Materials Catalog

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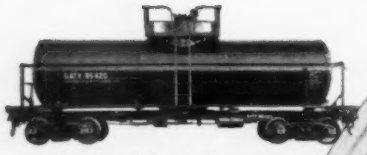
Sn Sb P Si Ti Zr organometallics and inorganics

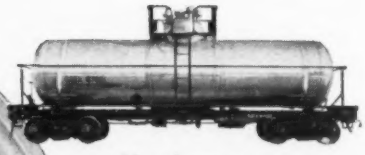
Rahway, N. J. Dept. W

GATX builds them all!

Kanigen® lined cars

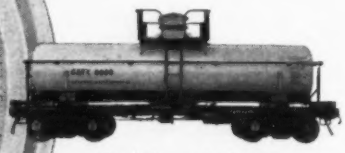


Standard flued-dome cars

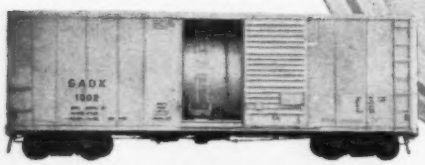


Aluminum cars

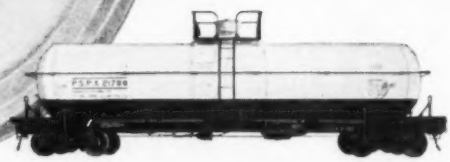
Wine cars



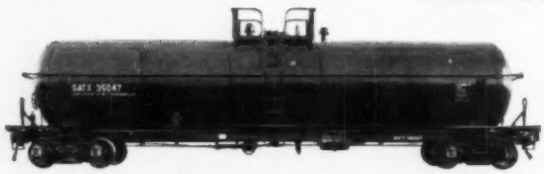
Stainless steel cars



Liquid oxygen cars



Insulated and non-insulated pressure cars



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What's Wrong with CPI Foreign Marketing?

Recent, rapid changes in international marketing not only have caused U.S. companies to revamp overseas sales efforts (CW, April 2, p. 27), but also have heightened foreign activity among American public relations and advertising agencies. A critic of U.S. firms' reliance on American-based marketing and advertising consultants is outspoken Stefan Jean Rundt, himself an international business consultant.

Rundt's views point up a growing conflict regarding the role that business consultants, service agencies and organizations such as market research, public relations and advertising firms should play in helping U.S. chemical companies market the $1.6 billion worth of products they will sell abroad this year.

On one hand is the view shared by Rundt and many primarily financial consultants. They see agency efforts abroad as unnecessary — even running counter to sound international business practices. Rundt, founder and head of S. J. Rundt & Associates (New York), says bluntly: "I don't think much of Madison Avenue consultants."

On the other hand, some public relations firms claim that U.S. marketing techniques — much more advanced than those generally found abroad — are applicable overseas, with variations and adjustments that allow for local customs and conventions. They contend that U.S.-based advertising and public relations agencies are better equipped than their foreign counterparts to make the application, because they know this country's business and marketing techniques, have learned how to work with foreign affiliated agencies.

Exclusively International: S. J. Rundt & Associates has plenty of believers. It was established in '54 as an exclusively international consulting service, has, in the six years since, built an impressive list of clients and subscribers, including close to 100 U.S. companies (50 are CPI concerns) and their subsidiaries, four dozen U.S. commercial banks, and many foreign financial institutions, finance or economic ministries, treasuries and central banks. One of its services, sold on a subscription basis, is a series of reports on business and political conditions in overseas markets.

The reports include weekly intelligence briefs covering 30-45 world markets, and individual market reports, each dealing with a specific area. At $300/year, it is among the highest-priced combined services of its kind. Thirty percent of the firm's revenue comes from this service, 60% from retainers, 10% from *ad hoc* consultations.

The organization, primarily concerned with international finance, licensing, investments, foreign exchange, credits and market accessibility, reflects Rundt's viewpoint, which in turn mirrors his training as a former U.S. intelligence officer and his background in international banking. Most of the commercial and financial intelligence he has to offer, for example, comes from his friends and contacts abroad who are engaged in those activities.

"Most of this type of information," says Rundt, "is readily and overtly obtainable, if you are willing to read until your eyes drop out. We regularly read 400 publications in 11 languages."

Rundt's select staff numbers less than a half-dozen paid employees, plainly illustrates his view that bulky staffs aren't needed. Some of his employees are overseas. He draws on the help of many others, however, people who would not have access to significant information if they were in his employ. "The secret is in setting up a good communications system as a fast channel of information. We have uncensored communications twice daily with Cuba," Rundt adds.

Analyze It Yourself: Rundt decries the growing use of overseas market research by international service agencies: "I don't think much of the studies that tell you how many left - handed, mother - of - pearl - studded screwdrivers you can sell in Ghana. We believe a U.S. company can do a better job of market evaluation by itself, if it simply has fast, up-to-date financial and commercial information. It must make an honest appraisal of conditions and give them a great deal of study.

"We've frankly told many of our clients to save the money they would spend to have a market study done, and, instead, to hire a competent national (local agency) to work for and

'I don't think much of Madison Ave. consultants with all the answers.'

'Most commercial intelligence information is overtly obtainable.'

'We tell our clients to do their own market research and save money.'

CW PHOTOS—DOUG KIRKLAND

how

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with them. Often I have helped select a national that would act as the client's local investigator, with the possibility, of course, of later becoming the head of the client's foreign operation."

In the setting of his casually appointed Manhattan office, adjacent to his apartment, Rundt (whose slight accent evidence his European background) looks and acts the part of the successful banker. When he warns of the need to learn the ways of customers and contacts abroad, and calls for first studying the foreign market then considering the product to be sold there, he is most convincing as the international businessman.

When he speaks of economics as being politically influenced, or claims that trade either carries the flag or follows it — "I believe trade must carry the flag" — Rundt becomes the kind of outspoken, dissident personality preferred as a speaker by international community groups.

Rundt sees these major concerns facing CPI international management this year: contraction of the Latin-American market (*CW Viewpoint, April 2*), credit-term competition and the upcoming GATT negotiations (*CW, April 9, p. 20*).

The Other View: Many market research, public relations and advertising consultants providing services abroad do not share Rundt's views. There is a place, this group says, for the U.S. consultant overseas, primarily because of the need abroad for more advanced marketing and promotion techniques.

They say further that most foreigners are not versed in marketing, know little or nothing about U.S. company business philosophy and methods.

On one point most of these agencies agree with Rundt: localized service is a must. And localized service should be carried out by local agencies where practical. By localized service, they mean service on the spot, in the foreign country, for the U.S. affiliate, subsidiary, etc. This on-the-spot service often can be carried out by a local agency under direction and, most likely, control by an American service organization hired by the U.S. client.

One agency that specializes in selling localized, coordinated service is Barnet and Reef Associates (New York). The firm operates in the international field, provides a "full range" of marketing activities. The overseas phase of B&R's business is handled by its affiliate PR International. The overseas arm of the agency is controlled by B&R, partly owned by local affiliated agencies in the 48 markets it serves.

Major advantage of this divided, but equal, setup, according to B&R Account Coordinator Tom Dorsey, is that it provides an opportunity for localized service by local agencies that have a stake in the business.

Coordination is provided from New York headquarters for all clients, regardless of their location. In addition, regionalized coordination is provided abroad from major centers of activity. For example, European activities are coordinated from PR International's office in Geneva, tax-haven site of many U.S. affiliate and holding companies.

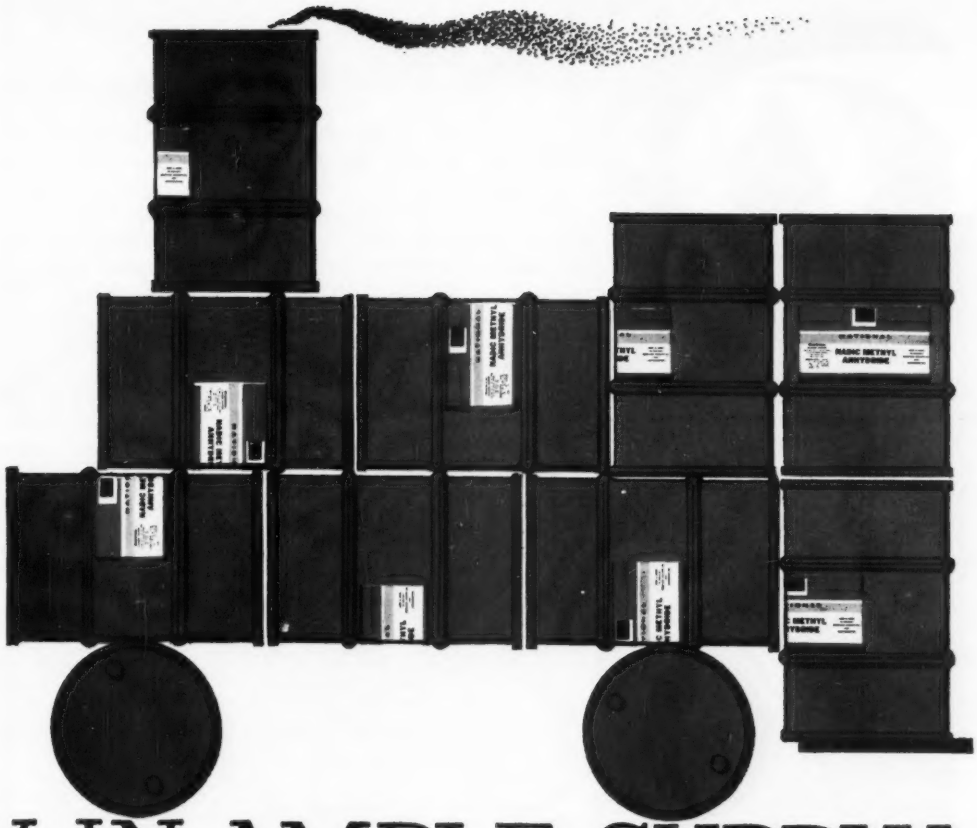
B&R stresses the importance of living abroad for people who attempt to advise U.S. concerns on foreign markets. This, says Dorsey, enables consultants and agency people in this country to get first-hand knowledge of customs and habits of people with whom their clients will be working. Incidentally, this theme of knowing the local market and its people is emphasized by most U.S. agencies offering service abroad.

B&R's examples of the importance of applying sound marketing and promotional techniques abroad:

• "You are a U.S. company with a water purifier that can do a needed job in Latin-American areas. You single out a country whose waters are clogged with wastes. First step is an information program to educate the people and government regarding the state of their water supply.

"Since criticism is a 'family' matter, your public relations campaign wisely enlists the aid of chemistry professors, newspaper editors, officials, and other nationals who support water purification. Only after the program is well under way do you enter the scene to offer assistance" to the country.

• "You are a pharmaceutical company with a new plant in a southeast Asian country that's antiforeign, nationalistic and is aggressively fostering local industry. You label your drugs 'local products' to conceal



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"Your sales lag pitifully. At length, you seek outside counsel and find the explanation: the people of this Asian land still mistrust the purity and quality content of local pharmaceutical products, prefer to buy American drugs."

Winning Confidence: Gale Benn Associates (New York), like B&R, a relatively new firm, points out that a great deal of effort must go into winning the confidence of local management in U.S. subsidiaries and affiliates abroad. According to Bob Stuart, administrative and marketing head of the agency, "It's a long time before you sit down to business, even after you've been hired."

Stuart, also a supporter of localized service for U.S. clients operating abroad, believes that the ideal is to have in the organization a man who knows American marketing and promotion techniques and who has traveled and worked abroad. Then the problem is one of adapting those techniques to fit local customs and attitudes.

As an example of a company that didn't adapt U.S. techniques properly, Stuart cites the aircraft concern that had a contract to build fighter planes for a European country. The company placed ads in local newspapers pointing to its contribution in the defense of the country and the anti-Communist world — not at all unusual in a U.S. promotion campaign. Local citizens, however, objected, called the advertisement "war mongering."

A Growth Business: Advising U.S. companies doing business abroad is becoming a big business. For U.S. marketing men, whether they subscribe to the concept advanced by Rundt or to that suggested by public relations and ad agencies, this means added assistance in applying overseas commercial and financial intelligence and the advanced techniques of market-data collection and analysis, promotion and public relations. In the highly competitive race for foreign markets, U.S. concerns are likely to need all the overseas intelligence and every sound marketing technique they can muster. The real test will come in adapting data and techniques to specific overseas marketing problems.

More Drive for Salesmen

Chemical salesmen are driving farther this year than they did in '59 (*CW, Dec. 26, '59, p. 53*). That's the report of A. J. Schoen, president of Wheels, Inc., Chicago-based auto fleet leasing company. For CPI companies, this reflects stiffening competition for sales, augurs higher road costs during the rest of '60.

Schoen says chemical salesmen drove an average of 1,672 miles/month on business calls during the first four months of this year. Average business mileage in the same period last year: 1,589.

At the present rate, Schoen notes, chemical sellers will average nearly 20,000 miles of business driving this year, compared with 18,750 last year.

This reflects toughening competition, he says, that shows up in customers demanding speedier deliveries, more price concessions, watching closely the quality of goods received.

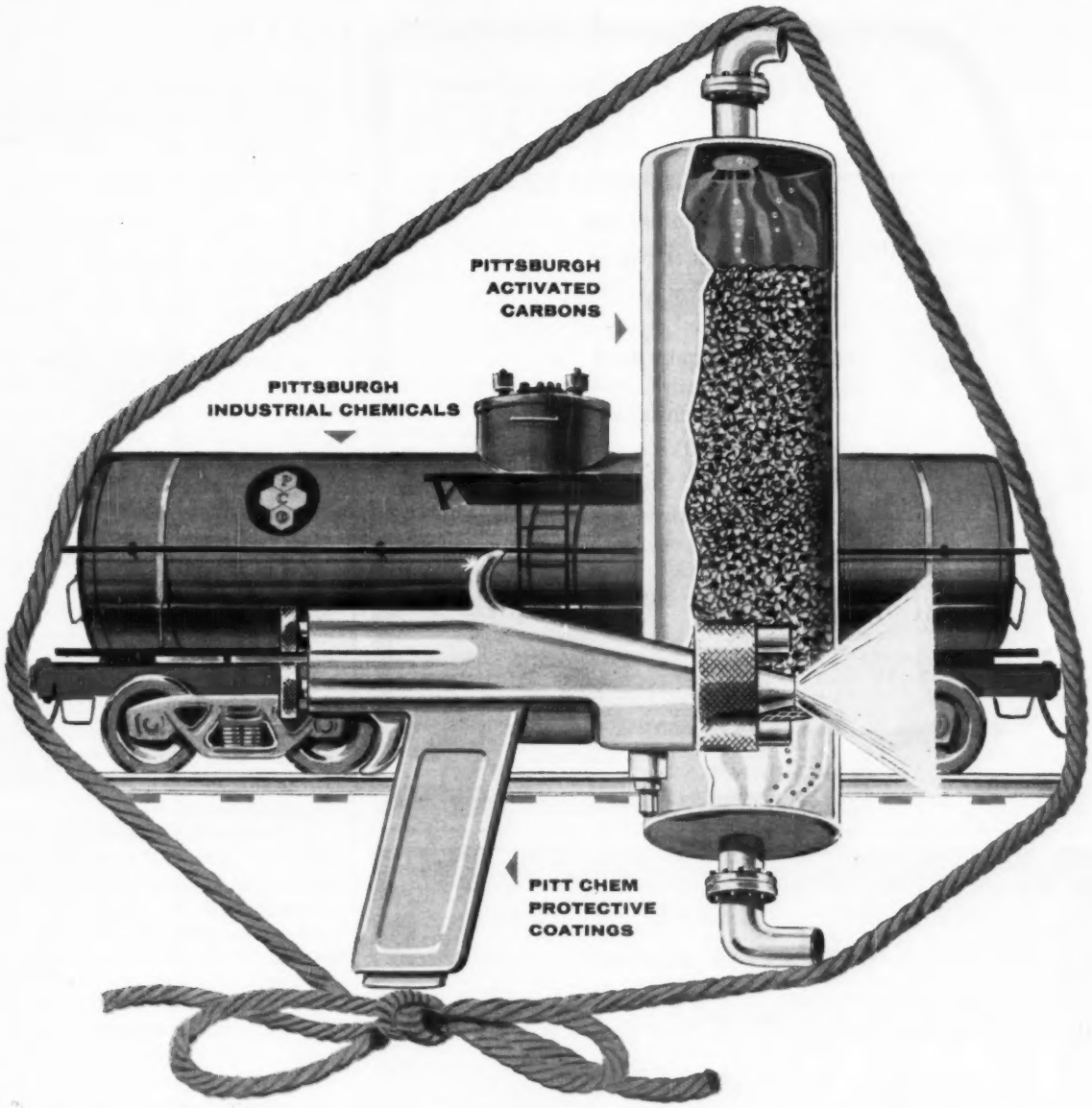
DATA DIGEST

• **Price List — Pharmaceuticals:** New, 18-page booklet tabulates price/quantity data for company's line of reagents, intermediates and finished pharmaceuticals. Special Chemicals Dept., Winthrop Laboratories, division of Sterling Drug Inc. (1450 Broadway, New York 18).

• **Nonionic Surfactants:** Folder lists properties and uses of nonionic surface-active chemicals. Surfactants described: glycol and polyglycol esters, other polyhydric alcohol esters and polyoxyethylene alkyl aryl esters. Hodag Chemical Corp. (7247 North Central Park, Chicago 45).

• **Benzotrifluoride and Isomers:** Revised technical bulletin describes the properties and some typical reactions of benzotrifluoride and its ortho-, meta- and para-chloro isomers. Applications suggested: transformer fluids, suspending media, insulating media, fungicides and insecticides, dielectric fluids, pharmaceutical and dyestuff manufacture. Hooker Chemical Corp. (P.O. Box 344, Niagara Falls, N.Y.).

• **Corn Oil Booklet:** Revised 20-page booklet discusses manufacture, properties and uses of corn oil. Also included: data on constituents of corn oil, description of packaging, storage and handling, statistics on supply, distribution and use of corn oil and



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Pittsburgh Coke's former Industrial Chemicals, Protective Coatings and Activated Carbon Divisions and their supporting technical departments, have been combined in a wholly-owned, autonomously operating subsidiary—*Pittsburgh Chemical Company.*

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Pittsburgh Chemical will vigorously maintain a policy of planned growth and expansion through: (1) intensive new process and application research, (2) alert personalized sales service and (3) responsive and competent technical assistance.

Write, wire or phone us by our new name—Pittsburgh Chemical—and watch things happen . . . *for you!*

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glossary of special terms. Corn Industries Research Foundation, Inc. (1001 Connecticut Ave., N.W., Washington, D.C.).

• **Polysulfide Rubber:** Bulletin (CS-1) describes improved resistance to compression set of polysulfide rubbers when calcium oxides are used as activators. Thiokol Chemical Corp. (780 North Clinton Ave., Trenton 7, N.J.).

• **Industrial Plastics:** Booklet lists properties and applications of company's various fabricated industrial plastics, including nylon, polycarbonates, fluorocarbons, chlorinated polyethers, cross-linked polystyrenes. Polymer Corp. of Pennsylvania (Reading, Pa.).

• **Fermentation Chemicals:** Data sheets describe company's line of brewer's yeast fractions, used as fermentation media and chemical intermediates. Amber Laboratories (3456 North Buffum St., Milwaukee 12).

• **Swiss Chemicals:** Directory lists companies comprising the chemical industry in Switzerland. Verlag Fuer Wirtschaftsliteratur GmbH. (Zurich 55, Switzerland.).

• **Heat-Sealing Polyethylene:** New data sheet outlines the common heat-sealing problems associated with polyethylene, lists the causes and corrective measures for them. U.S. Industrial Chemicals Co., division of National Distillers and Chemical Corp. (99 Park Ave., New York 16).

• **Polyethylene Glycols:** New, 40-page booklet gives property and use data on family of polyethylene glycols, used in cosmetic bases, ointment and suppository vehicles, tablet binders and coatings and pharmaceutical jellies. Numerous charts and tables present data graphically. Union Carbide Chemicals Co. (New York).

• **Silicones:** Brochure summarizes the forms, properties and applications of silicone materials. Among silicone products described: adhesives, release agents, laminating resins, electrical insulating compounds, water repellents. Dow Corning Corp. (Midland, Mich.).

• **Carbon Dioxide:** Booklet details the properties, uses, and methods of distribution for carbon dioxide in gaseous, liquid or solid form. Supply systems ranging from 20-lb. cylinders to 100-ton receivers are described. Pure Carbonic Co., division of Air Reduction Co., Inc. (150 East 42nd St., New York 17).

CHEMICALS OUTLOOK

May, 1960

This news bulletin about Wyandotte Chemicals services, products, and their applications, is published to help keep you posted. Perhaps you will want to route these and subsequent facts to interested members of your organization. Additional information and trial quantities of Wyandotte products are available upon request . . . may we serve you?

NEW FLEET OF BARGES TO SERVE SOUTH SOON

The first caustic barge of a new fleet of inland waterway barges is now ready to service customers in the South . . . the remainder of the fleet to serve both chlorine and caustic customers is under construction and will be readied throughout the summer months.

The barges will be based at our Geismar Works, near Baton Rouge, Louisiana . . . and will deliver chlorine and liquid caustic to points adjacent to the intracoastal waterway along the Gulf Coast from Florida to Texas, and on the Mississippi River and its principal tributaries.

Each of the caustic barges will hold 1200 tons of caustic liquor . . . equalling the capacity of twenty 10,000-gallon tank cars . . . and will be 11 feet high, 26 feet wide, 195 feet long. Chlorine-barge capacity will be 600 tons.

Having operated a fleet of Great Lakes ships since the turn of the century, Wyandotte pioneered in the water transportation of bulk chemicals. In 1908, Wyandotte originated an automatic unloading system enabling a ship to discharge cargo at the rate of 1200 tons an hour . . . setting the pattern for most Great Lakes ships of today.

With the opening of the St. Lawrence Seaway, the economics of water transportation has been emphasized. Wyandotte's locations on the Detroit River and the Mississippi, coupled with our experience and the new barge fleet, will enable customers in a strategic position on these inland waterways to take even greater advantage of it. If you are interested in water shipment of bulk chemicals, contact us.

MODERN TECHNIQUE FOR NATURAL-GAS DEHYDRATION USES CALCIUM CHLORIDE

To insure uninterrupted flow of natural gas throughout the year, producers in cold-weather regions must remove water vapor at individual well sites . . . before the gas enters the gathering system, and is subject to freezing temperatures.

To accomplish this, a dehydration unit has been developed that consists of an integral-separator section, a series of trays containing calcium chloride brine in increasing degrees of concentration, and a calcium chloride bed (or desiccant pot).

In the integral-separator section free liquids, water, and hydrocarbons are extracted from the wet gas . . . which then flows through the series of trays, where it comes in contact with the brine and is further dehydrated. In the final stage, the gas flows into the calcium chloride bed, where any water remaining is absorbed. Average cost of the process has been computed at $3.00 per million cubic feet.

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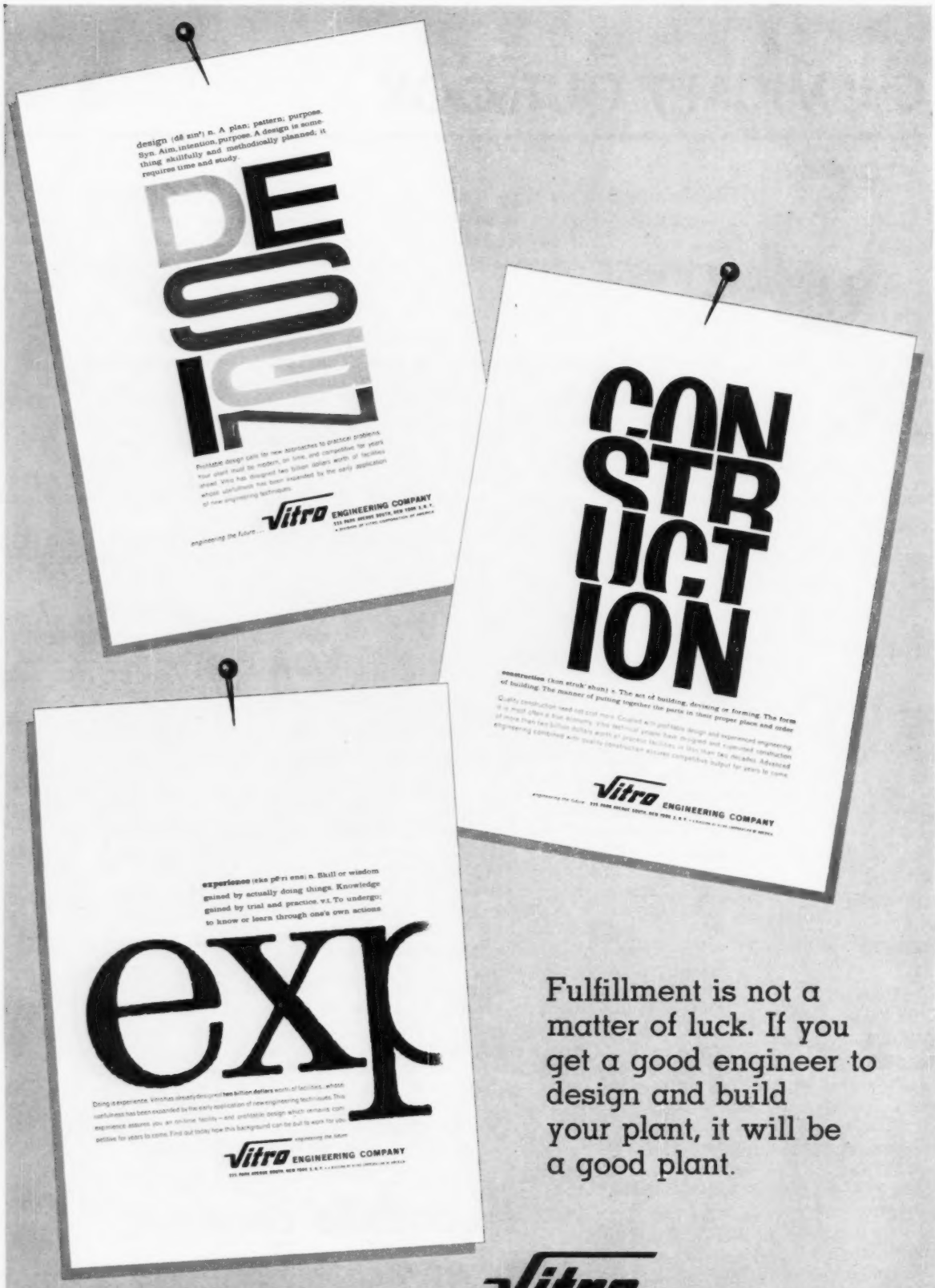
design (dĭ zīn') n. A plan; pattern; purpose. Syn. Aim, intention, purpose. A design is something skillfully and methodically planned; it requires time and study.
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experience (ĭks pē'rĭ ĕns) n. Skill or wisdom gained by actually doing things. Knowledge gained by trial and practice. v.t. To undergo; to know or learn through one's own actions.
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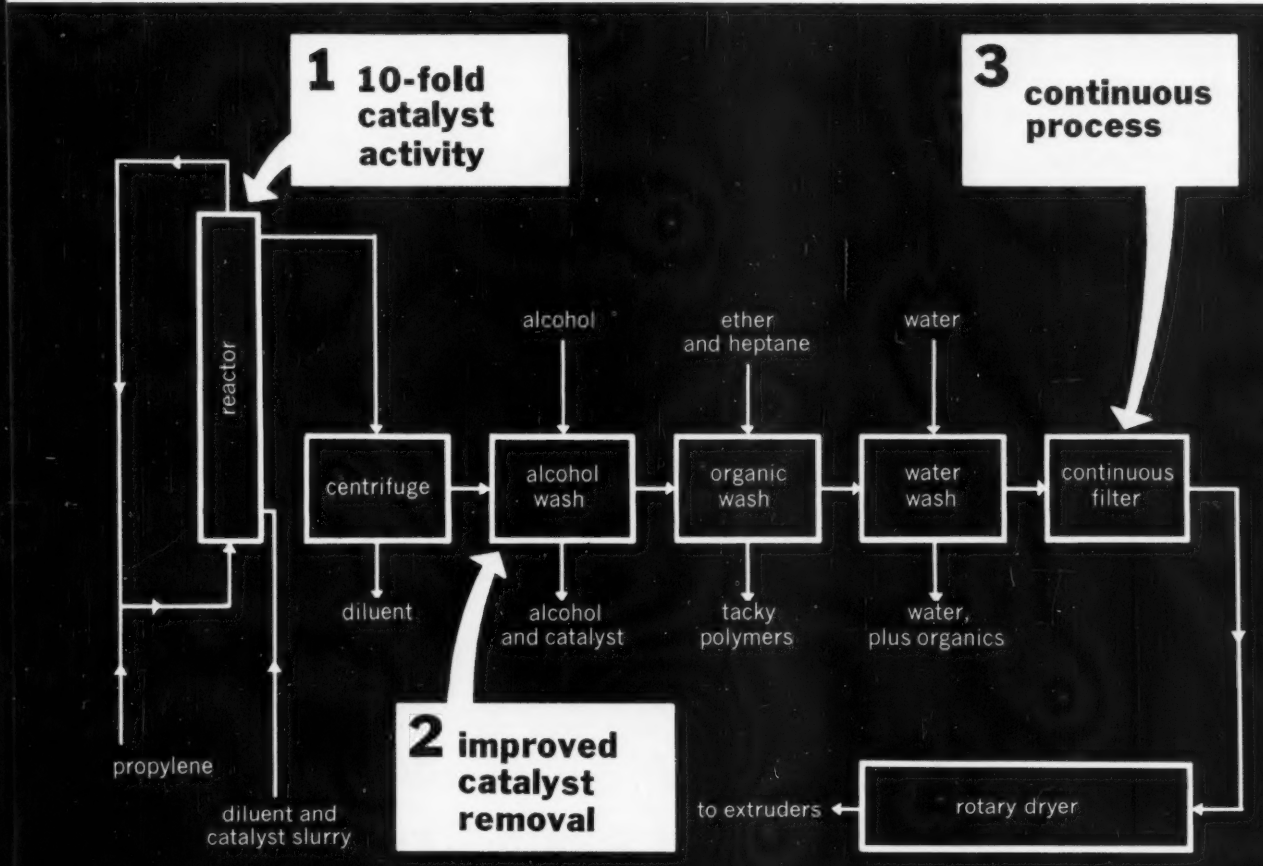
Three keys to Esso's polypropylene



Backing Esso's Polypropylene Bid

Humble and Esso engineers, who last week showed off Humble Oil's new polypropylene unit in Baytown, were eager to point out three features likely to give it the lead in the race for polypropylene profits. But they were more than reluctant to give process details.

But close study of the unit shows pretty well how the "radically improved" catalyst and improved solvent removal have put polypropylene manufacture on a continuous basis. And it helps explain how the new unit, costing an estimated $10-12 million, will permit propylene producers to count on an investment of about $240 per annual ton.

Since current polypropylene plant prices are about $840/ton, the improvement makes manufacture of this plastic extremely attractive. Even at the current high investment price, it has plenty of adherents because of its special properties (light weight, chemical inertness, high softening point, strength, and ease of forming or extruding). In the 2½ years since the first commercial polypropylene was produced, U.S. production had grown last year to 20 million lbs. and is expected to hit 50-60 million this year.

Besides Esso. the young plastic has attracted AviSun, Dow Chemical, Hercules Powder, Novamont, and Texas Eastman (*CW, Nov. 14, '59, p. 61.*) All these companies are keeping their processes strictly secret, although most of them are licensees to the original process developed in 1953 by Karl Ziegler.

The extraordinary secrecy stems from a confused patent situation. Most U.S. companies have developed their own processes—and applied for patents—almost simultaneously. So right now there's a log-jam of patent applications that will take some time to clear up. In the meantime the companies are doing research and development independently, building their plants, and producing polypropylene in the hope that their work is original or at least not subject to patent infringement penalties.

Esso's Process: Scattered reports of

Esso engineers, a limited view of its plant, and the claims of improved processing give some idea of how Esso has solved the problems of converting a gaseous petroleum product into a solid plastic. The three critical points: (1) the reactors, (2) the catalyst-polymer separation, (3) the changeover from liquid to solids handling techniques.

• *The reactors:* To convert propylene into polypropylene the propylene gas must be dissolved in an inert liquid and mixed with suspended catalyst particles. Esso states it uses a catalyst slurry; it claims to have increased catalyst activity 10-fold; and its reactors are three towers operating in parallel, each with an overhead vapor line to allow undissolved propylene leaving the solution to be recycled into the propylene feed. Furthermore, Esso engineers speaking at Galveston say: "By proper selection of the polymerization conditions, almost any ratio of atactic, isotactic, and stereoblock polymer can be produced."

This statement may give the key to the entire process, for conditions in the reactor thus control the method of catalyst-polymer separation and the changeover to solids handling.

The significance of this selectivity of the polymer type is that the atactic and stereoblock materials are sticky or tacky—have none of the useful properties of the crystalline product. These materials can be separated by washing out the tacky polymers with a mixture of heptane (a fairly readily obtainable refinery product) and ether solvent. Much of the work on cleaning up these materials was done by Giulio Natta working with Karl Ziegler on early production of the plastic.

Esso can define the conditions that govern its end-product, which pretty well explains its basic reaction system. Best guess is that the propylene is fed (probably under pressure control) to a unit (sparger) at the bottom of the reactor tower that sprays in the feedstock in such a way that the incoming gas content is continuously mixed. Solid catalyst in a slurry with inert hydrocarbon (e.g., normal heptane) is fed directly above the sparger. As the propylene reacts, it goes out of solution and allows more of the incoming gas to dissolve, until the catalyst-crystalline concentration ratio has reached an optimum. Pressure is controlled at about 60 psig. simply to increase the amount of propylene in solution. And a catalyst-crystalline product slurry is drawn off at a location designed to give the desired holdup time.

• *Catalyst removal.* This is a tricky point, and again one in which Esso's work is significant. Although the Ziegler-type catalysts are solid and are contacted with the propylene in the form of a slurry of fine particles, they cannot be removed as solids. Instead, they are dissolved in a special solvent and discarded—the catalyst is thus a once-through material. Titanium trichloride, the catalyst Natta employs, is soluble in a variety of alcohols; which alcohol Esso uses has not been disclosed.

If, as the Esso engineers report, the production of tacky polymers can be kept at a minimum in the reactor, the product slurry could be mixed directly with the catalyst-removing alcohol. In this case, the alcohol and hydrocarbon liquid (the inert liquid used to dissolve the propylene gas) would separate into two immiscible layers—leaving undissolved crystals of polypropylene in the lower alcohol layer (since the polypropylene has an 0.88 specific gravity, about that of the alcohol used). The crystals would then have to be filtered out and washed.

On the other hand the tacky polypropylene might be washed out with the ether-normal heptane mixture. In this case the reactor product is centrifuged, washed with alcohol to remove catalyst, centrifuged again, and then washed to remove tacky polypropylene.

• *Changover:* Before the polypropylene crystals can be separated and dried for solids handling, they must be washed with water. The crystals will not separate from hydrocarbons into a water layer, and alcohols are soluble in water. So the crystals must be filtered out before the water-wash. In this case the water-washing can be done on the filter drum. Esso's pilot plants use continuous vacuum filters for this.

Once the crystals are water-washed and filtered, they are conveyed to a rotary dryer. For this step Esso uses two dryers operating in series, each about 100 ft. long and each heated with low-pressure steam in a jacket about the dryer shell. From the dryers, the crystals are conveyed to extruding machines, where they are melted and squeezed into long spaghetti-like strings, which are cooled, chopped into pellets and bagged.

Research Write-off: Although the Humble unit cost only an estimated $10-12 million, future investors will have to take into account an additional $15 million that Esso spent developing the process. This research cost to Esso (and to other propylene process originators) will have to be written off before new plant costs get down to the estimated $240/annual ton. Meantime, patent priorities will have to be cleared. Thus, polypropylene prices can be expected to hold to their present 42¢/lb.

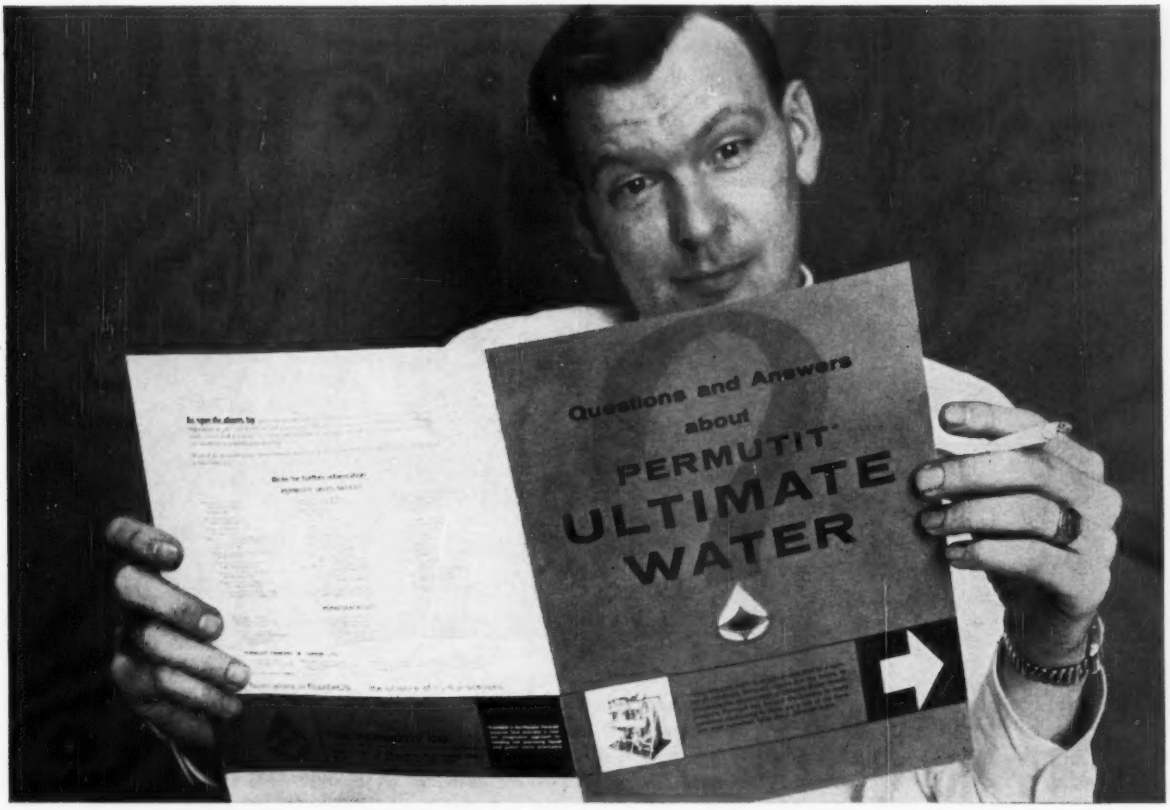
Yet, even at these prices, polypropylene markets are likely to continue their current fast rate of expansion. During the Humble unit's startup ceremonies, members of the press were given an opportunity to inspect polypropylene cups, coasters, briefcases, cap pistols, dishes, insulated wires, and ship mooring lines. All had superior feel, texture, density and stiffness, and all were claimed to be easily formed from the bulk material. Esso is betting these properties will find markets to justify expanding its new "petroplastic" unit from 40 to 100 million lbs./year.

Fertilizer Buildup

Fertilizer processing received a substantial capacity boost in the form of two major expansions this month. Olin Mathieson last week started up a $1.5-million addition that will increase the output of its Pasadena, Tex., plant by 40% (*CW Market Newsletter, May 14*). And in Kennewick, Wash., this week, California Spray-Chemical Corp. officially opens a new, $5-million plant tailored to meet the growing fertilizer demand in the Pacific Northwest.

OM's buildup was designed primarily to beef up the company's line of high-analysis fertilizers — mixed formulations containing more than 30% of nitrogen, phosphorus and potassium plant nutrients. The Pasadena plant will continue to follow its existing processing pattern—making wet-process phosphoric acid from Florida phosphate rock; reacting phosphoric with ammonia from OM's Lake Charles, La., plant; pelletizing the

FLUIDICS* AT WORK



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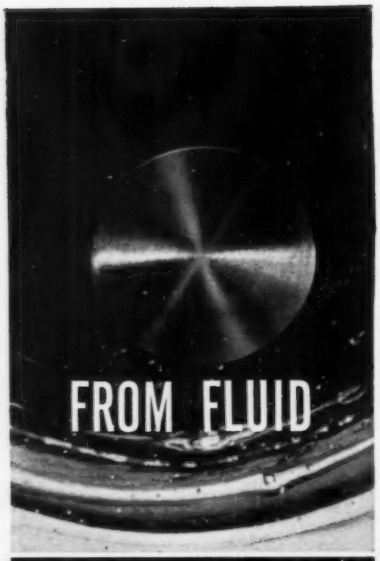

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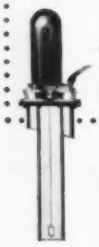

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ammonium phosphate, with or without the addition of potash from the Carlsbad, N.M., area.

Process Innovations: Calspray's new plant consists of three major units—a 150-tons/day nitric acid plant (based on 100% acid), an ammonium nitrate facility rated at 200 tons/day of nitrate solutions or 150 tons/day of dry prilled product, and a complex fertilizer plant designed to turn out 300 tons/day of pelleted complex plant foods. The process employed at Kennewick is Calspray's Unipel process in which the phosphate rock is acidulated with nitric acid (instead of with sulfuric acid, more commonly used in making wet-process phosphoric).

The plant was designed and built by The Chemical and Industrial Corp. (Cincinnati), includes two special features claimed to simplify the handling operations required for product finishing. One very noticable feature is the ammonium nitrate plant's small prilling tower—only one-third as high as many conventional towers. Key to this compactness, says C&I, is the preconcentration of ammonium nitrate to an almost anhydrous melt. This minimizes the free fall required to permit prills to solidify completely, produces prills that can be handled more easily than those made from 95-96% nitrate solutions.

The other special feature of the plant is the C&I spherodizer used for pelletizing and drying complex fertilizer formulations. In this unit, the feed slurry of mixed fertilizer is sprayed continuously onto curtains of falling particles through which hot drying gases are passed. Unlike other granulating methods, spherodizing produces pellets built up in a layer-by-layer accumulation of successive coatings. Results: product is dry throughout; spherodizer has a very low recycle rate.

The spherodizer pelleting system has been used before in a Cuban fertilizer plant and by Western Phosphates (Salt Lake City). The latter started up last year, reports that, to date, spherodizing has not been completely satisfactory.

In addition to complex plant foods and ammonium nitrate prills and solution, Calspray will also produce aqua ammonia (20% nitrogen) and anhydrous ammonia (82% nitrogen) for the Pacific Northwest area.

Throttling the Thrust

Solid-propellant adherents have played a new, high card in their efforts to win more rocket power-plant markets (*CW Technology Newsletter, May 7*). At McGregor, Tex., Rocketdyne (division of North American Aviation) engineers have successfully test fired a solid-fuel motor with a thrust that can be varied by 70%.

This makes the second major gain for solid fuels within the last few months; Thiokol recently disclosed that it is continuously mixing the solids at its Marshall, Tex., works (*CW, April 16, p. 104*).

But the development of variable thrust will help even more in the solids' battle with liquid-fueled motors. In current rockets, the thrust from liquid fuels can be varied by changing the feed rate, while solid fuels now used give the same thrust from ignition to burnout.

Key to the new motor is a variable-throat nozzle. When the test motor was fired, the thrust was first lowered and then brought back up through a range of 700 to 1,200 lbs. Engineers believe that more-sensitive fuels can be controlled through an even greater range. The nozzle is uncooled, is said to be able to withstand 5500 F over the propellant burn time.

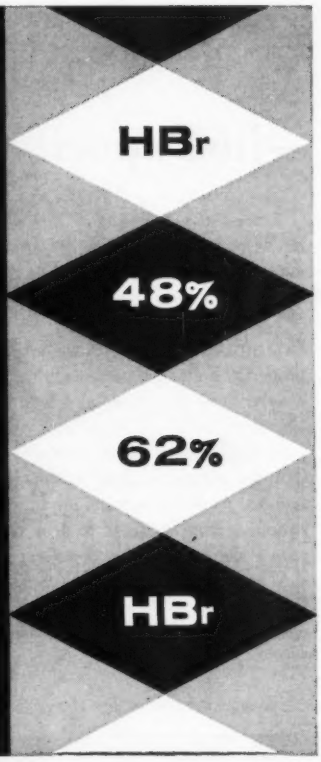
Methane Cleanup

Solvay Process Division of Allied Chemical Corp. is installing (at Moundsville, W. Va.) a new low-temperature unit to recover ultrahigh-purity methane from natural gas.

The unit, designed by Air Products, Inc. (Allentown, Pa.), is contained in a single "cold box," is more compact than conventional warm-type methane fractionation units. The process: natural gas passes through (1) a caustic scrubber to remove carbon dioxide, (2) a regenerative-type alumina dryer, (3) a feed-product heat exchanger, (4) an expansion valve, then enters the distillation tower.

Heavier hydrocarbons leave the bottom of the tower; 99.99%-pure methane passes overhead. The overhead product is divided into two streams, one for heat exchange against the feed, the other for use in a methane refrigeration system supplying reflux chilling. The warm methane vapors are rejoined at the product outlet to make halogenated products.

Hydrobromic Acid



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Check these useful reactions: Hydrobromic acid is a strong acid which reacts readily with most inorganic bases to produce inorganic bromides such as lithium, sodium, potassium and ammonium bromide, useful in photographic processes.

It reacts with many aliphatic alcohols in the presence of dehydrating agents to produce aliphatic bromides. Aliphatic bromides, which are generally more reactive than the corresponding chlorides, are useful in the preparation of Grignard reagents and other organometallic bromides, quaternary ammonium salts and as alkylating agents.

Hydrobromic acid can be used to cleave ethers to produce aliphatic alcohol and bromide. It will also react with epoxides to produce vicinal bromohydrins with two reactive centers, thus, permitting many additional reactive possibilities.

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Analysis:	48% Technical
Molecular Weight:	80.924
Specific Gravity at 20/4° C:	1.488
Pounds a gallon at 20° C:	12.4
HCl, not more than:	0.10%
Vapor Pressure at 30° C:	—
Vapor Pressure at 50° C:	—

Analysis:	62% Technical
Molecular Weight:	80.924
Specific Gravity at 20/4° C:	1.74
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HCl, not more than:	0.15%
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Vapor Pressure at 50° C:	380 mm

For complete listing of Michigan Chemical products, see your copy of Chemical Materials Catalog or Chemical Week Buyers Guide.

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Market Newsletter

CHEMICAL WEEK
May 21, 1960

Nopco Chemical's intent to place in operation a 10-20-million-lbs./year toluene diisocyanate plant by '62 *(CW Business Newsletter, May 7)* compounds the problems of TDI producers who right now have a substantial overcapacity on hand. Total TDI demand this year is put at some 35-38 million lbs.; capacity will climb to about 58.5 million lbs., by midyear.

There's no doubt that polyurethane foam (and coating) markets will continue to grow steadily during the coming years; but the forthcoming supply/demand situation can't be wholly answered simply by evaluating impact of Nopco's withdrawal as buyer.

It's quite possible, for instance, that Nopco's move will spark similar action by other foam producers weighing the advisability of making their own TDI. Industry observers agree there's now a good chance that other CPI firms will come in as producers of TDI for captive and /or marketing purposes.

But trying to predict the identity of future TDI producers is only one aspect of the knotty TDI-polyurethane market situation.

There are, of course, many highly optimistic forecasts of polyurethane markets. But actual demand volumes are now exceedingly difficult to pinpoint because the industry is still very young and many development problems must be overcome.

Consequently, it's far more realistic to spell out future markets by contrasting probable minimal demands against those demands that could emerge if all developmental "ifs" are ironed out (*CW, Nov. 28, '59, p. 54*).

Best guess now: at least 200 million lbs. of polyurethane foams will be used in '64—but the market could climb to 300 million lbs. by then if foam producers can break into new fields, improve isocyanate technology, and meet potential competition from newer, lower-cost foam products.

•

Day-to-day trading has pushed the cost of rubber, in London, to its highest level since Nov. '59; but outlook for the rest of '60 is for a generally firm price picture.

Meanwhile, a close look at world rubber supplies by the International Rubber Study Group (representing almost all producing countries) reveals a probable comfortable surplus of available rubber this year. World consumption of natural rubber is put at 2.11 million tons, production at 2.13 million tons.

Rubber released from U.K. and U.S. stockpiles has bolstered the modest 25,000-ton surplus, and possible further stockpile releases of perhaps 75,000 tons will boost surplus rubber to some 195,000 tons—a

volume not considered to be of glut proportions because stocks have fallen to low levels.

A similar supply/demand balance exists for synthetic rubber, according to the study group. Estimated output this year is 1.81 million tons while consumption is pegged at 1.17 million tons. The indicated surplus is needed as a buffer against steadily rising demands for synthetic rubber.

•

Price of industrial-grade potash is hiked $2/ton by International Minerals & Chemical, effective July 1. The increase restores the firm's bulk price of refined potassium chloride to '56's level of $29/ton, f.o.b. Carlsbad, N.M.

The increase is part of a general price-firming pattern that began last month when U.S. Borax & Chemical initiated an industry-wide boost of agricultural-grade potash prices (*CW Market Newsletter, April 16, p. 23*).

•

Use of commercial fertilizers will hit 10 million tons/year by '75, according to the latest issue of "Fertilizer Trends," a biennial publication of the Tennessee Valley Authority. Current consumption is estimated at 6.5 million tons/year.

The publication predicts these tonnage increases during '60-'75: nitrogen up 74%, from 2.3 million to 4 million tons; phosphate up 39%, from 2.3 million to 3.2 million tons; potash up about 47%, from 1.9 million to about 2.8 million tons.

•

Syndet and soap sales reached a new peak in first-quarter '60, according to Assn. of American Soap & Glycerine Producers, Inc.

Synthetic detergent sales were up 12.7% over first-quarter '59, totaling 825.8 million lbs. Greatest growth was in the liquid detergents, which were up 41.3%, as sales hit 161.7 million lbs. Meanwhile, the big-volume solid synthetic detergents increased only 7.4%, on first quarter sales of 64 million lbs.

Soap sales, steadily decreasing throughout the '50s, were 5.6% higher than in first-quarter '59. Sales volume: 256 million lbs.

•

"Synthetic natural" rubber producers continue to jockey for position. This week Phillips Chemical Co. reports plans to start operation of its expanded *cis*-4 polybutadiene facilities during fourth-quarter '60. Commercial shipments are expected to begin by the first of next year.

Last week Shell Chemical moved ahead on plans to triple capacity of its "synthetic natural" rubber entry, polyisoprene (*CW Business Newsletter, May 14*).

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Coke Chemicals Come Back Strong

Most coke-oven chemicals have made a nice recovery from their steel-strike-induced production slump in '59. And by this week it was plain that there will be adequate supplies through '60.

As a matter of fact, neither the steel strike nor the subsequent business revival strained supplies.

The sharp slump in production of coke chemicals during the strike was largely cushioned by an especially heavy output earlier in '59 (*see charts, p. 93*); and so far this year, general industrial and business activity, although good, hasn't grown to boom proportions.

Production Plateau: Following settlement of the steel strike, production of most coke chemicals quickly climbed back to about the levels of early '59. If these levels are maintained throughout most of '60—even allowing for some seasonal declines during the summer months—total production this year should compare favorably with total '59 output, perhaps approximate records achieved in '57.

Preliminary production totals* reveal that output of coke-derived benzene amounted to about 119.8 million gal. in '59, compared with 118.3 in '58 (also depressed because of the general business recession) and a substantially higher 179.2 million gal. in '57.

However, toluene output apparently slumped to about 26.8 million gal. in '59, from 28.1 million in '58 and 38 million in '57. Xylene followed a similar pattern; output in '59 was 7.5 million gal., compared with 8.4 million in '58 and 10.8 million in '57.

But toluene and xylene supplies reportedly are adequate, inventories are good, and producers describe the supply/demand situation as "healthy."

Right now demand for benzene is described as "brisk," and there has been evidence of some "scare" buying because of low inventories. Aside from Russian-made benzene, imports in general are easing off as total world demand climbs and less is available for export to the U.S. However, no alarm is voiced about over-all supplies—despite possible localized shortages—because demand for benzene is expected to ease off somewhat in the near future.

Naphthalene Improves: Naphthalene production increased to 408 million lbs. in '59 from 345 million lbs. in '58; but last year's higher output was still a long way from the high of 420.2 million lbs. produced in '57.

After the steel strike, naphthalene output jumped to high levels in the early months of '60 (*see chart, p. 93*). Nonetheless, supplies are admittedly still tight; in fact the resulting high cost of naphthalene was cited as one justification for a phthalic anhydride price boost earlier this year (*CW, March 5, p. 80; CW Market Newsletter, March 12*).

Naphthalene buyers and producers are surprised and puzzled by recent trade reports that increasing amounts are being exported from the U.S. this year; according to these unconfirmed reports, about 2.3 million lbs. were shipped out of the U.S. in the first three months of '60.

Why is naphthalene exported when consumers are scrounging for it here at home? Explanations include the possibility that the exports are in fulfillment of earlier contract commitments, that brokers in the U.S. are taking advantage of premium prices paid overseas (a particularly likely explanation in light of reports that in some parts of Europe naphthalene is bringing as much as 10½¢/lb).

And naphthalene imports have also been relatively high, totaled about 8.8 million lbs. in the first two months of '60.† Some observers close to the European coke-chemicals business say imports are now tapering off but will probably pick up again in the third quarter.

Sulfate Surplus: Surprisingly, coke-derived ammonium sulfate is far more available this year than in '59, although output is running substantially below that of early '59—about 139.4 million lbs. in March '60 (up about 4.7% from February), compared with 147.5 million in March '59.

Sales are also down, to some 124.6 million lbs. in March '60 vs. 199.3 million in the same month last year.

Coke-chemicals marketers say the ammonium sulfate plenitude probably results from a combination of factors: increased production of sulfate from other sources, weaker fertilizer demand, possible switch to other forms of nitrogen by fertilizer mixers.

In any case, industry spokesmen claim there's no serious oversupply but admit there is "probably more available than the market can absorb." Likelihood of any significant price changes in the near future is considered remote.

Phenol Stable: Phenol's production pattern in '59 more closely paralleled '58 monthly fluctuations, showed less violent reaction to the steel strike than did most other coke chemicals. But total output of 39.8 million lbs. during the year was somewhat lower than in '58 (42.6 million) and in '57 (41.8 million).

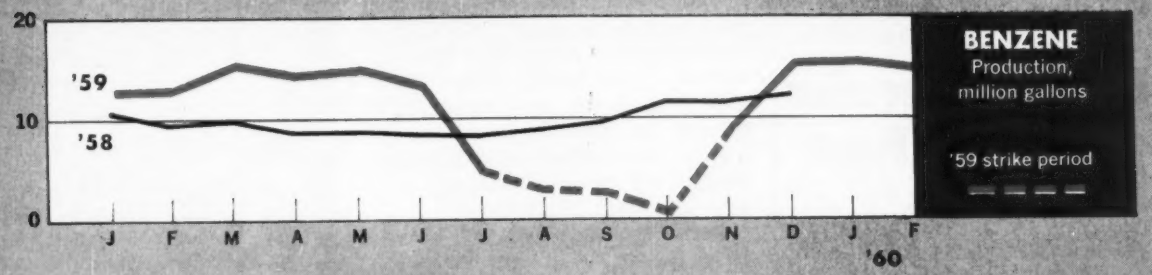
More violent were strike-induced fluctuations of pyridine production, although total output of about 2 million lbs. (refined, 2-degree material) was substantially more than 1.38 million produced in '58 and 1.82 million made in '57. In any case pyridine supply problems have been ameliorated by steady output of synthetic material.

Earlier this year a slackening of pyridine imports eased competitive pressure on U.S. sellers. Although trade observers were unable to pinpoint reasons behind the decline of imports of this material, one development thought to be a major factor is a tighter supply/demand situation

* Final production totals, out later this year, may differ somewhat from preliminary estimates, and monthly data may not add up exactly to revised and adjusted year-end totals.

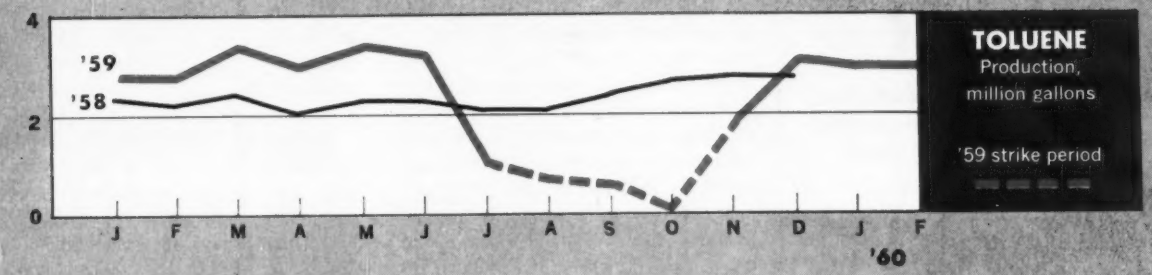
† U.S. naphthalene imports in the first two months of '60 came from Canada, 1,067,780 lbs.; United Kingdom, 3,353,641; Netherlands, 1,436,520; Belgium, 1,881,954; Poland, 551,150; other countries, 519,924; total, 8,810,969.

MARKETS



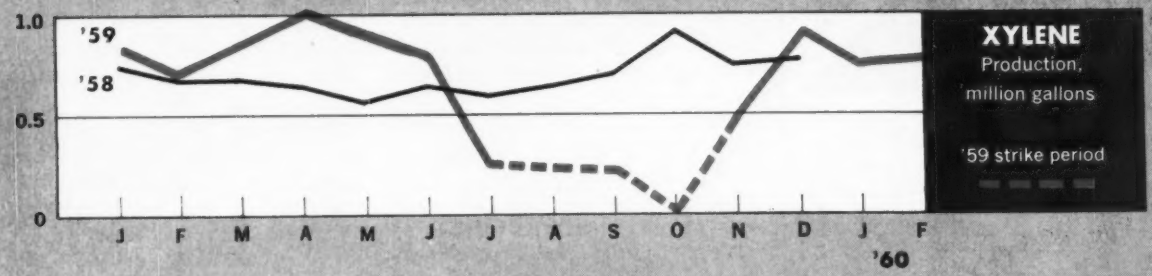
BENZENE
Production,
million gallons

'59 strike period



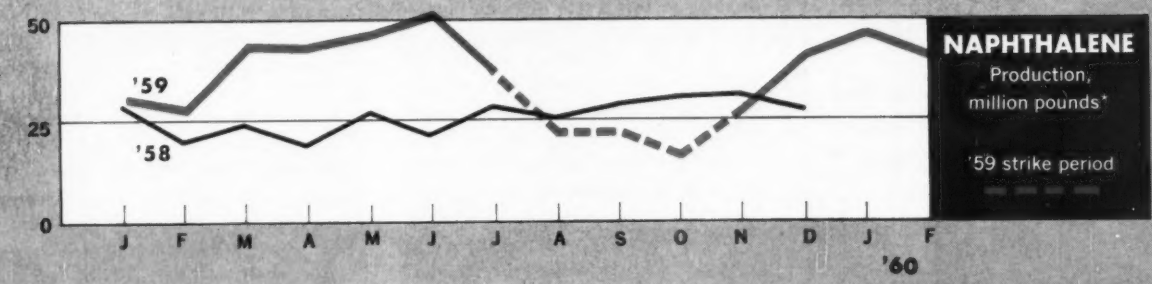
TOLUENE
Production,
million gallons

'59 strike period



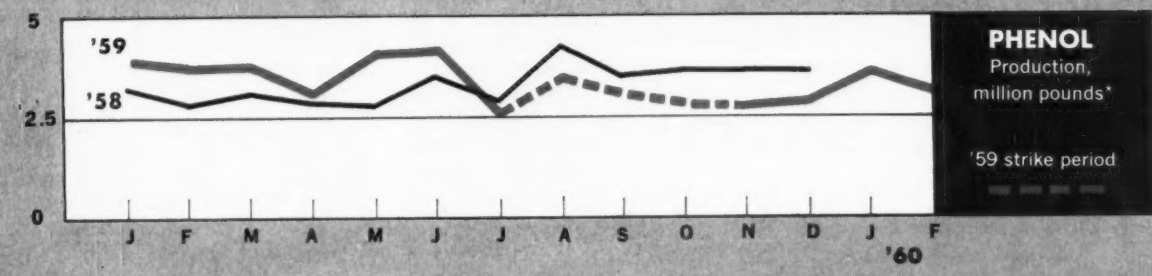
XYLENE
Production,
million gallons

'59 strike period



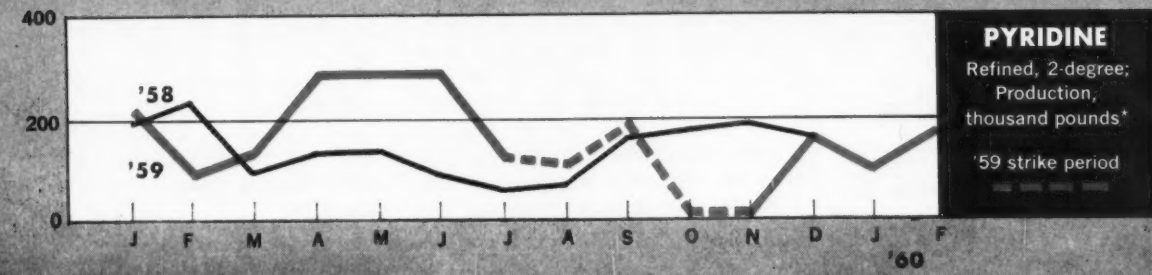
NAPHTHALENE
Production,
million pounds*

'59 strike period



PHENOL
Production,
million pounds*

'59 strike period



PYRIDINE
Refined, 2-degree;
Production,
thousand pounds*

'59 strike period

*Includes tar distillers.

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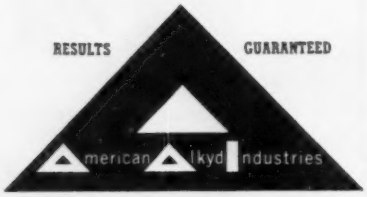

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that has built up in foreign markets.

This development points up the need for U.S. chemical buyers to be more wary about depending on foreign sources of chemicals. Overseas industrial expansions are increasing the demands for raw materials — often without much warning—and this can unexpectedly siphon off material previously exported to the U.S.

Steel Signposts: Users of coke chemicals are, of course, checking the pulse of steel production, seeking to anticipate fluctuations in supplies of coke chemicals. But using steel output data as an index to availability of coke chemicals is primarily helpful in long-term forecasting, is in itself unreliable as a guide to what will happen in the next few weeks.

Right now steel production is reportedly running at about 80% of capacity, will likely be reduced to 75%—perhaps less—in the summer months. Chances are that production will again climb to 85-90% of capacity in the fall.

The anticipated near-future decline in steel output is partly attributed to buildup of adequate consumer stocks sooner than was expected. The reason: apparently users are satisfied with relatively light inventories because (1) there is plenty of steelmaking capacity, (2) no supply-hampering strikes are in sight, (3) failure of a major business boom to appear on schedule is putting no undue demands on available metal.

How do these steelmaking trends jibe with coke-chemicals production? A steel industry spokesman notes that in the past few months output of coke chemicals has been moving at a higher rate—roughly about 90% of capacity—than has steel production.

During the rest of '60, coke chemicals will follow roughly the pattern—although not necessarily week by week—of expected steel output. This means that coke-chemicals production will likely slack off during the summer months, pick up again in second-half '60.

For buyers it spells a familiar story. Most needs will be adequately met—probably much better than in '59—but some buyers will have to look a little harder for such items as naphthalene. In any case there is very little chance that a really serious supply crisis will develop in any area of the coke-chemicals business.

MARKETPLACE

Synthetic vitamin E is available in bulk quantities from Chas. Pfizer & Co. It will be supplied in four virtually odorless and tasteless forms for use in liquid and dry pharmaceutical preparations.

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•

Shawinigan Resins Corp. has cut the price of Resin D-243—a borax stable polyvinyl acetate-dibutyl maleate copolymer emulsion—by 1½¢/lb. Carload and truckload tabs are now 20¾¢/lb.; in 20 to 39 drums, 21½¢/lb.; 4 to 19 drums, 22½¢/lb.; 1 to 3 drums, 23¢/lb. Major application for the resin is in adhesives formulation.

•

Pyromellitic acid (PMA) and pyromellitic dianhydride (PMDA) are being produced at Du Pont's multimillion-pounds/year unit at Repauno Works, Gibbstown, N.J. New prices: 85¢/lb. for PMA and $1/lb. for PMDA. The materials are useful in synthesis of high-temperature lubricants and plasticizers, as components of polyester and alkyd resins, and as intermediates in preparation of various polymers.

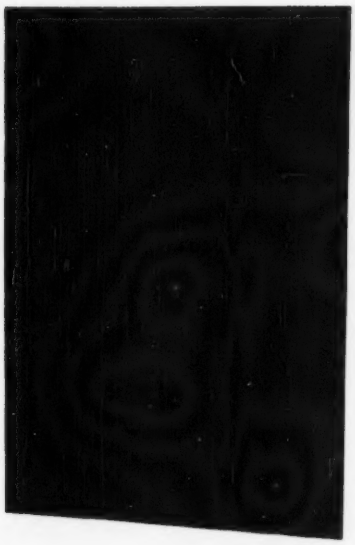
•

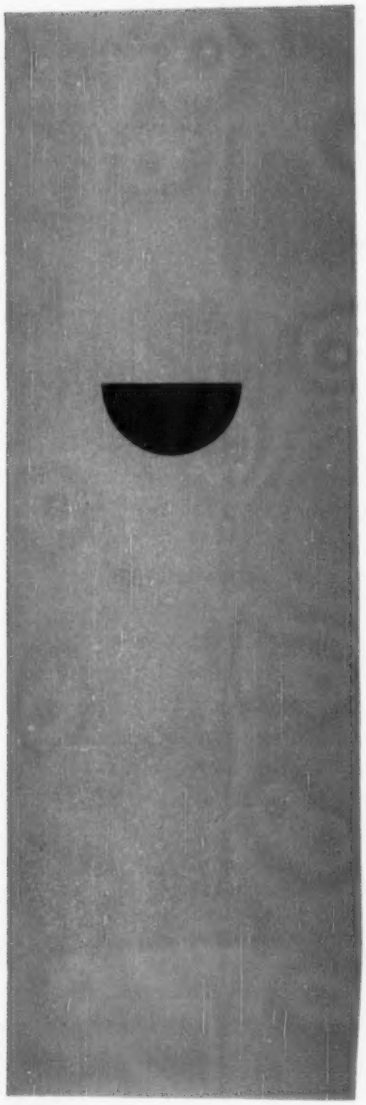
Du Pont has cut the price of "oxone" monopersulfate compound—an oxygen-type bleaching agent—by 5¢/lb. New truckload price is 30¢/lb. The material is now used in home laundry bleaches, household cleaners, and in industrial bleaching of synthetic fibers.

•

Houses in the future may be heated and lighted by the sun's energy that will be captured and stored in walls, predicts William Drees, research vice-president of Formica Corp., subsidiary of American Cyanamid Co.

As a long-range project, Formica is exploring possibility of using luminescent wall panels that would build up energy during the day, emit it as heat and light at night; it's one of many potential applications that should greatly increase use of plastics in building construction in the years ahead.





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Recent Economic Growth — The Numbers Game

If it truly portrayed recent rates of economic growth in the United States, the report on employment, growth and price levels recently issued by the staff of the Joint (Congressional) Economic Committee would point up scarcely less than a national disaster. Among other things, it would document impressively Premier Khrushchev's crack that "the capitalist steed the United States is riding . . . is worn out."

One of the major findings of the Joint Committee's staff (in the Eckstein Report, named for its staff director Otto Eckstein) is that between 1953 and 1959 the average rate of growth of physical output in the United States was only 2.4 per cent per year. This is scarcely more than half the average annual rate of growth of 4.6 per cent the staff found to have prevailed between 1947 and 1953.

Happily, however, the report does not reflect the basic economic realities. Its finding on relative rates of economic growth for the two periods is a statistical *tour de force* which, by the selection of certain figures and certain dates, distorts the record of America's long-term economic growth.

Playing The Numbers Game

By the selection of appropriate starting and terminal periods it is possible to document almost any rate of economic growth that is desired. The table at the bottom of this page shows you how this can be done. It will also show you how the Eckstein staff worked out its shocking contrast in growth rates. The table is built like a schedule of airplane fares between different cities. The postwar years 1946 through 1959 are put down on two axes. One runs down the left hand column, the other runs across the top of the table. Put your finger on the point where the two axes intersect and you have the average rate of growth for the period covered.

ANNUAL AVERAGE GROWTH RATES OF THE U.S. ECONOMY, 1946-1959*

(Percent increases, starting year to terminal year, of GNP in 1954 dollars)

Starting Year \ Terminal Year	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
1946	X	-0.1	-1.9	-1.2	3.0	3.9	3.8	3.9	3.2	3.7	3.6	3.4	2.9	3.2
1947	X	X	3.8	1.8	4.1	4.9	4.6	4.6	3.7	4.2	4.0	3.8	3.2	3.5
1948	X	X	X	-0.1	4.2	5.3	4.8	4.7	3.6	4.3	4.0	3.8	3.1	3.4
1949	X	X	X	X	8.7	8.1	6.5	6.0	4.4	5.0	4.6	4.2	3.5	3.8
1950	X	X	X	X	X	7.4	5.4	5.1	3.4	4.3	3.9	3.6	2.9	3.3
1951	X	X	X	X	X	X	3.4	3.9	2.0	3.5	3.2	3.0	2.2	2.8
1952	X	X	X	X	X	X	X	4.4	1.3	3.6	3.2	2.9	2.0	2.6
1953	X	X	X	X	X	X	X	X	-1.6	3.2	2.8	2.6	1.6	2.4
1954	X	X	X	X	X	X	X	X	X	8.1	5.1	4.0	2.4	3.2
1955	X	X	X	X	X	X	X	X	X	X	2.1	2.0	0.5	2.0
1956	X	X	X	X	X	X	X	X	X	X	X	1.8	-0.2	2.0
1957	X	X	X	X	X	X	X	X	X	X	X	X	-2.3	2.0
1958	X	X	X	X	X	X	X	X	X	X	X	X	X	7.0
1959														

*Compound rates of growth

Following this procedure, you can find growth rates ranging all the way from −2.3 per cent, between 1957 and 1958, to +8.7 per cent, between 1949 and 1950, along with almost any other rate you would choose for various years and sequences of several years over the postwar period.

For example, if you want to demonstrate that the postwar growth rate through 1953 was less than 4% per year, you take off from 1946, include a drop of 0.1 per cent between 1946 and 1947, and come up with a growth rate for the 1946-1953 period of 3.9 per cent. But if you want to show it was quite high, you take off a year later, from 1947 (which drops out that dismal −0.1 per cent for 1947) and come up with a fine growth rate of 4.6 per cent for the 1947-1953 years.

Statistical Hocus-Pocus

That's what the Eckstein staff did. It took off at one end from a year when there was just about no growth, went to the Korean War boom year of 1953 at the other end, and got that average growth rate of 4.6 per cent. Then it took off from the Korean War boom year of 1953 and ran to the year 1959, when business was recovering from a recession and suffered through a steel strike of 116 days, to come up with its 2.4 per cent growth rate for the second postwar period. As the table indicates, by taking off a year later (1954) the average growth rate would have become 3.2 per cent, and if the take off had been 1949 it would have been 3.8 per cent.

There are those who, in nontechnical terms, would characterize this as statistical hocus-pocus. There are also those who would see in it an element of political hocus-pocus, too. This is because the years 1947-53, when the Eckstein staff found there had been the healthy 4.6 per cent growth rate, were roughly years when we had a Democratic president, while the anemic growth rate of 2.4 per cent it calculated for the subsequent years was for years of a Republican presidency.

Actually it can be shown that the civilian part of our economy has had more rapid growth during the Republican administration than it had during the Democratic years. If military expenditures are subtracted from the national ouput, the resulting growth rate for 1953 to 1959 is slightly higher than for 1947 to 1953.

However, we do not question the *bona fides* of the Eckstein staff. **But we do assert that it has produced a statistical picture of the postwar growth of the American economy which is dangerously misleading both at home and abroad.**

Abroad, the report appears to give official documentation to the propaganda line that the Soviet economy is running rings around the U.S. economy in growth, and that it is Communism a country should choose if it really wants to develop rapidly. Building on a much smaller economic base than the U.S.A., the Soviet Union — as well as almost every less advanced nation in the world — is bound to show a larger percentage increase in output than the U.S.A. But the Eckstein staff calculation gives the Communists ammunition they don't deserve.

Are We Facing A Crisis?

The contrast drawn by the Joint Committee staff in postwar U.S. growth rates suggests that we are facing scarcely less than a crisis through paralysis of our economic growth which calls for drastic remedies. But this, as the full 1947 to 1959 growth record set forth in the table makes clear, is very definitely not the case. Our over-all postwar rate of growth, as measured by the gross national product in physical terms, has been 3.5 per cent per year, a rate nearly double the long-term growth rate of 2 per cent per year between 1909 and 1939. In the continuing fluctuations in the rate of growth which more or less inevitably characterize a relatively free economy, we have had some downs in recent years. **But our economy is now on the upbeat again. And at the end of this year, the U.S. economic growth rate for the postwar period can be expected to be 3.7 per cent per year.**

It is extremely important for the United States to continue to maintain this rate of economic growth or even to surpass it. Upon this effort depends our capacity to meet our defense requirements without dangerous strain, to provide an adequate margin for foreign aid, to improve our own productive facilities, and to continue to raise our own standard of living.

How not only to maintain but possibly improve upon our postwar pace of economic growth will be the subject of strenuous debate in the months ahead. However, the debate will have a much better chance of being constructive if the postwar growth record is seen in proper perspective. To this end one of the first things to do is to junk panic rousing statistical portrayals such as that in the Eckstein report.

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Donald C. McGraw

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Clinical Trial* Typifies Trend to More Effective Antiallergy Steroids

Corticosteroid	Year introduced	Percent of patients reporting satisfactory relief
cortisone	1949	30
hydrocortisone	1954	44
prednisone or prednisolone	1955	85
triamcinolone	1957	80
α-dexamethasone	1958	86

*Conducted by Dr. Emanuel Schwartz of Long Island College Hospital on patients from a group of 50 with severe allergies that did not respond to any other treatment.

Steroids Pace Search for New Allergy Aids

New therapeutic techniques and new drugs are currently reorienting the broad field of allergy treatment. Convincing evidence was presented last week, for example, that corticosteroids can be safely and continuously used against allergies. And there are new developments in antihistamines and allergen extracts that also promise important gains in the treatment of an ailment that afflicts about 10% of the U.S. population.

Dr. Emanuel Schwartz, chief of the allergy clinic at Brooklyn's Long Island College Hospital, speaking at a New York state medical society meeting, reported on clinical experience with the corticosteroids (*see table, above*). He dealt with 50 patients with severe allergic ailments (49 with asthma; one with eczema). But Schwartz prescribed continuous use of the drugs, whereas most physicians, fearful of side effects, use the corticosteroid only in very severe cases (for the 30% of allergy patients who don't respond to antihistamines) and then only for a brief time, or intermittently over longer periods.

Schwartz' patients had responded to no previous treatments, were in immediate need of relief when he decided to try continuous, long-term steroid therapy. Length of treatment ranged from two years to the full nine years with the mean period being 4.7 years.

"The results," says Schwartz, "far surpass those previously obtained with any other agent or procedure." Originally, cortisone (developed in '49) was the only corticosteroid available, but as hydrocortisone ('54), prednisone and prednisolone ('55), triamcinolone ('57) and α-dexamethasone ('58) became available they were introduced into the program. A new addition to the study is β-dexamethasone, for which no results have yet been obtained but which appears to give "improved therapeutic response," according to Schwartz.

Results with the newer steroids have been decidedly better than with the cortisones, but the incidence of side effects has also risen. In general, though, the side effects have not been serious and have been greatly preferable to the allergic condition. Satisfactory relief was reported by more than 80% of the patients treated with the newer compounds, while 52-67% reported one or more side effects.

Key step was to determine the lowest daily maintenance dosage that would keep the allergy from recurring. In a few cases, medication could gradually be withdrawn without a return of allergic symptoms, but most patients require continued treatment under close medical supervision.

Soaring Market: The total wholesale market for corticosteroids will top $100 million this year, according to trade estimates (compared with $13 million in '50). Between $7-20 million of that will go for treatment of allergies. No firm figures are available because of the difficulty in tracking the drugs to their end-uses. Among the biggest sellers (for all uses) are Upjohn's Medrol (methylprednisolone), Lederle's Aristocort (triamcinolone), Merck's Decadron (α-dexamethasone) and Schering's Meticorten (prednisone).

Allergy sufferers may take steroids in a variety of forms; they are usually administered orally. Schering, for instance, offers aerosols and creams containing prednisolone for external treatment of skin diseases, including allergies. Squibb has a triamcinolone-containing lotion for similar use. For more severe outbreaks of skin allergy, Upjohn offers a highly soluble form of its methylprednisolone for intravenous injection.

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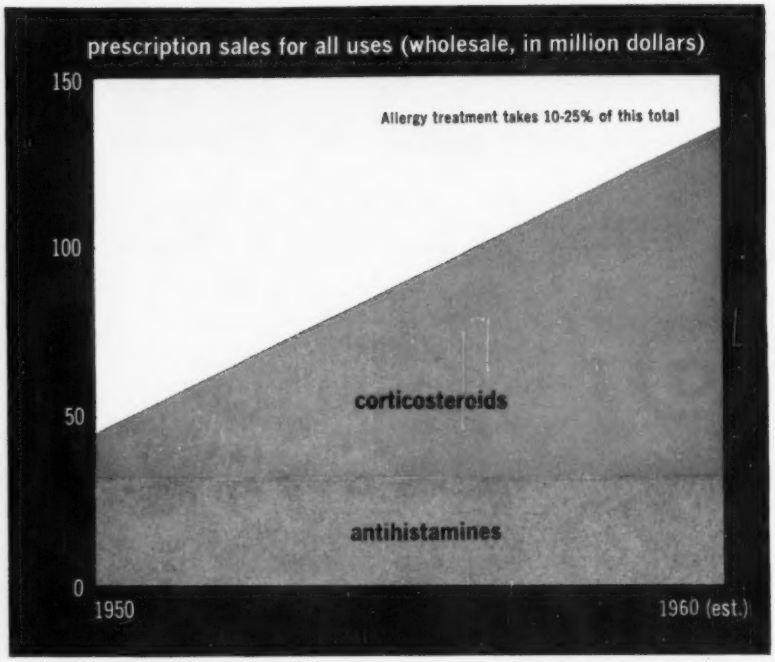
Booming Markets for Drugs Used in Allergy Treatment



steroids came on the scene, allergy symptoms were generally treated with antihistamines, with occasional resort to adrenaline compounds (epinephrine, ephedrine) or aminophylline for emergency use in severe attacks. These drugs are still in use, but their future isn't as bright as that of the steroids. The antihistamines, for example, had a wholesale prescription market of $28 million in '50, shortly rose to nearly $50 million, but will reach only an estimated $30 million in '60. Between 25-50% of this is for allergy treatment.

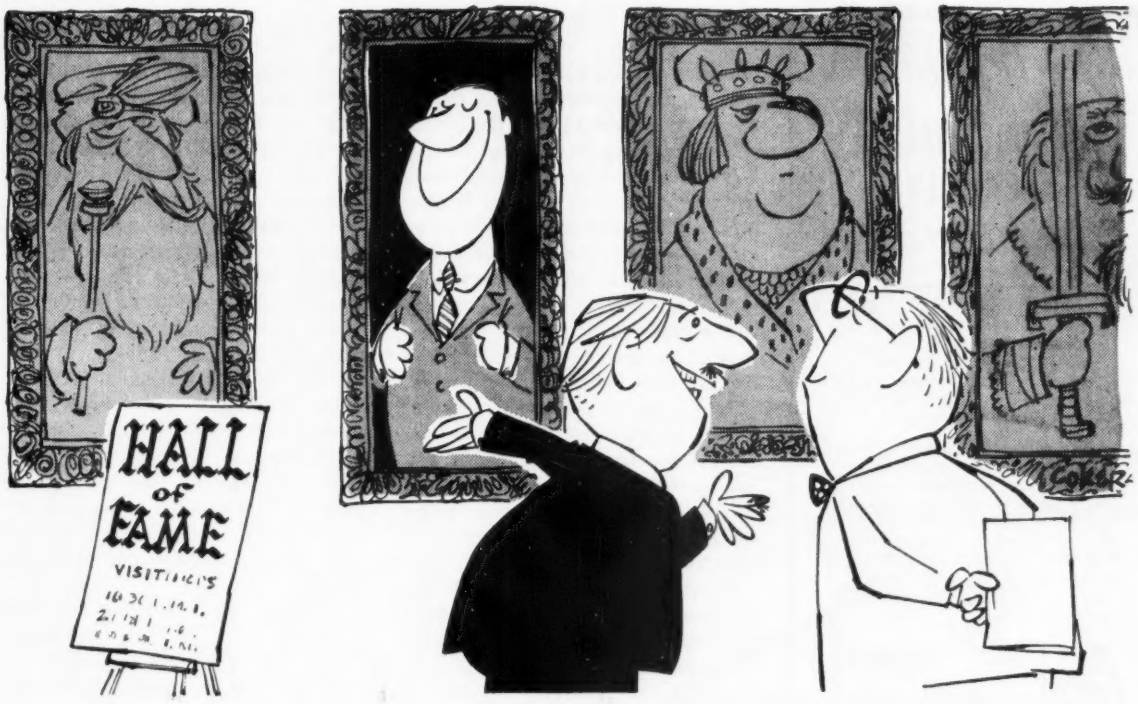
Nevertheless, new antihistamines are being continually reported by research groups all over the world. Probably the most significant recent development is Ciba's new class of isoindoline derivatives, the most potent of which —dimethpyrindene—is said to be two to four times as active as any other antihistamine (*CW Technology Newsletter, April 16*). But the big-volume materials have been used for years: Parke, Davis' Benadryl (diphenhydramine hydrochloride), Ciba's Pyribenzamine (tripelennamine hydrochloride) and Schering's Chlor-Trimeton (chlorprophenpyridamine maleate).

One approach that has been tried—with limited success to date: to combine steroids and antihistamines. Upjohn is planning a new product in this line, a combination of methylprednisolone and Orthoxine (methoxyphenamine hydrochloride). Advantages expected: minimal side effects, low price.

Until the steroids are less expensive, less prone to give side effects, the antihistamines will probably continue to be the first drug tried in allergy cases.

Building Immunity: Whereas the corticosteroids and antihistamines give only symptomatic relief of allergy, allergen extract shots can give immunity. Once the offending allergen is identified, about 75-80% of those who are sensitive to it can be immunized (usually for about a year) by a series of 20-40 shots containing a concentrated extract of the allergen. Polyvalent injections can be given to patients who are sensitive to a number of substances or in cases where the offending allergen has been narrowed down but not completey identified.

Biggest hope in this area is a one-shot immunizer that gives protection equivalent to the series of injections. Dr. Mary Loveless of New York Hospital-Cornell Medical Center (New York) has been working on such a material since '47. In its current form, it's an emulsion containing a very large dose of a water extract of the allergen in mineral oil. Ordinarily, the amount of allergen used would be



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too much to take; but in the emulsion, it enters the system gradually over a long period, without jolting the system.

The American Academy of Allergy is expected to launch a nationwide test of the Loveless material shortly. More than 25 doctors have been testing it under her direction for a year or more, but the AAA tests would be run independently. A large commercial allergen extract firm that has shown interest in the material is Hollister-Stier Laboratories (Spokane, Wash.), a wholly owned subsidiary of Cutter Laboratories. Center Laboratories (Manorhaven, L.I., N.Y.) also has an interest in the one-shot material. A similar immunizer is under development at Barry Laboratories (Detroit).

Among the questions about the emulsion yet to be answered are those concerned with shelf-life, transportability and safety of the material. Dr. Loveless has no doubts that the answers to these questions will be favorable to the product, but stresses that careful diagnosis is needed to determine the degree of each patient's sensitivity.

Basic Work: In addition to research aimed at developing new products, there is much delving into the causes and mechanism of allergies—studies that could pay off in new types of chemical treatment.

Southwest Research Institute (San Antonio, Tex.), for instance, has just completed a study of the chemical constituents of hay fever-causing pollens. Paper chromatography was used to analyze 107 different pollens, each containing 4-19 amino acids. In addition to aiding in the development of new allergen extracts, these results can lead to determination of which plants will cause allergy and identification of the sensitizing chemical compounds as well as to new approaches in plant breeding.

Abbott Laboratories is researching several classes of compounds for possible use in allergy treatment. Two symptomatic drugs now under study: a muscle relaxant for asthma treatment and a compound that constricts surface blood vessels, thus possibly inhibiting secretions responsible for skin allergies. Other studies are being made on homopiperazine derivatives and bronchodilators.

A big spur to basic allergy studies was given by the establishment of two groups in the past decade: Allergy Foundation of America (New York) in '53 and National Institute of Allergy and Infectious Diseases (Bethesda, Md.) in '55. The foundation was set up jointly by the American Academy of Allergy and the American College of Allergists to serve a number of functions, including the support of research. The six areas mapped out for study are (1) ways in which cells are affected by antigen-antibody reactions, (2) ways of preventing antibody formation, (3) histamine metabolism, (4) enzymes, (5) autosensitization, (6) collagen diseases.

The institute—a member of the National Institutes of Health—provides over $3 million/year to support research in universities, medical schools and other fundamental research centers.

Fundamental research of this sort is bound to open up new avenues of allergy treatment that may well, in turn, pay off in markets for new chemicals.

Gilt Foils Pitting

An engine with a gold-plated piston is used at Shell Research Ltd.'s Thornton Research Center near Chester, Cheshire, England, to help clarify why deposits of gasoline combustion products build up in engines. Unlike conventional pistons, the plated one resists pitting (by hot combustion gases), reduces physical adhesion of deposits. The gilded piston is not a commercial answer to the deposit problem, says Shell, but it may cast some light on how to prevent such deposits in conventional engines.

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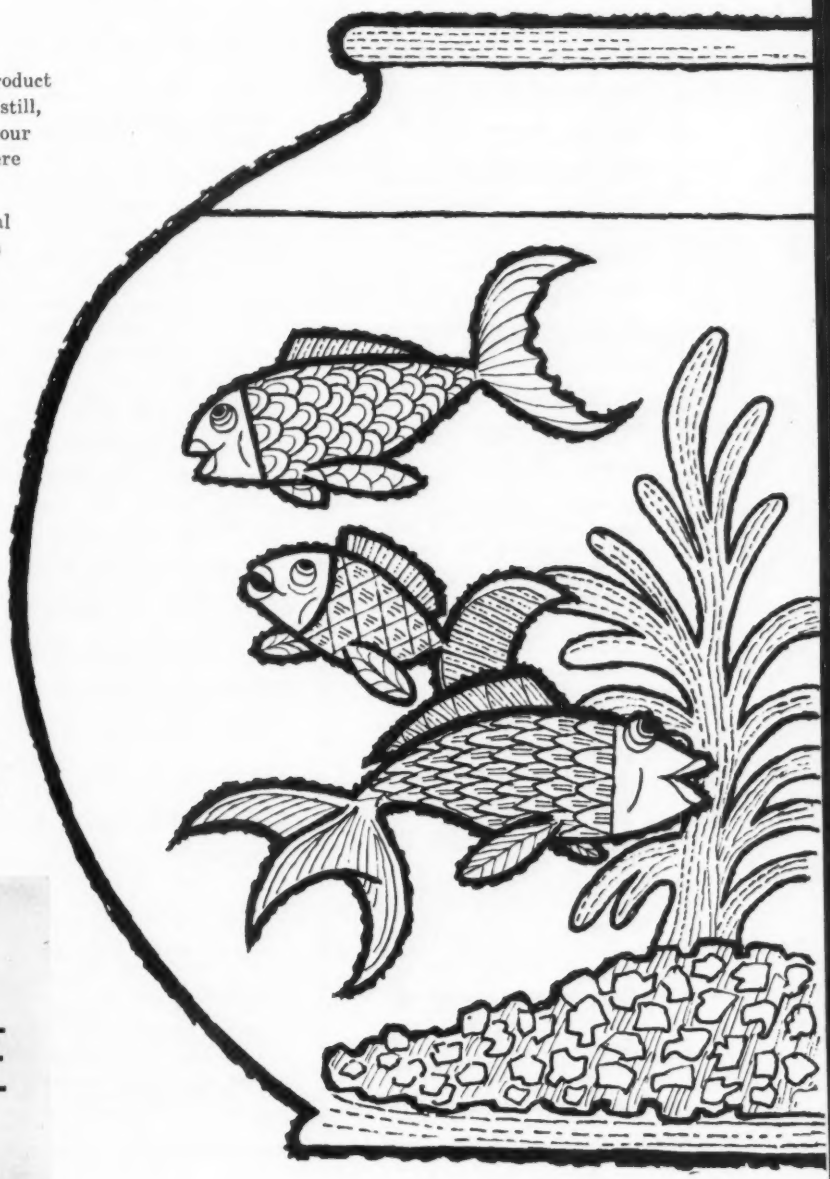

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CHEMICAL WEEK

BUYERS' GUIDE ISSUE

September 24, 1960
Forms close — June 15

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*For complete product data see catalog unit in the BUYERS' GUIDE ISSUE for 1959-60

RESEARCH

Smog Culprit Captured

The first smog component known to cause both eye irritation and plant damage has been isolated by a University of California (Riverside) research team. Called PAN (peroxyacetyl nitrite), it's a colorless white liquid that's highly explosive. Other known eye irritants in smog are acrolein and formaldehyde.

PAN was detected in air pollutants several years ago, later was identified chemically, but couldn't be isolated. Last year an artificial smog chamber was built on the Riverside campus. The compound—mixed with many others—was produced in the chamber, subsequently separated by chromatography.

University technicians John English and Eugene Cardiff and John Locke of W. E. Scott and Associates (Perkasie, Pa.) participated in the PAN studies. Earlier, Scott probed PAN at the Franklin Institute (Philadelphia).

Until now, there had been some doubt that a single substance could cause both eye smarting and plant injury. The Riverside group ran 30 tests on students who reported that PAN, in smog-type dilution, caused eye irritation. In similar dilutions, the compound caused severe injury to a wide variety of flower and crop plants.

The new research re-emphasizes the importance of getting rid of nitrogen oxides in air-pollution control, such as by development of suitable auto exhaust purifiers. It was previously thought that, although smog (resulting from photochemical reactions of chemical impurities in the air) contained various oxidized organic materials, nitrogen oxides merely served to initiate the reactions. Since PAN contains oxidized nitrogen, it's apparent that nitrogen oxides figure prominently in the smog problem.

EXPANSION

• Burlington Hosiery Co. (Burlington, N. C.), division of Burlington Industries, is now operating its new research center for studies (e.g., dyeing and finishing) pertaining to hosiery improvement and quality control.

• Monsanto's Organic Chemicals Division (St. Louis) has set up a new department of advanced, long-range organic chemicals research. Ferdinand Zienty is director of the new unit.

Tracers

TO THE CHEMICAL PROCESS INDUSTRIES

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***Unusual Opportunity for Chemist** (up to age 40) to attain major position in reputed medium size chemical specialties manufacturing company. Please address confidentially treated application to P-4456, Chemical Week.*

SELLING OPPORTUNITIES AVAILABLE

***Specialty equipment company requires manu**facturers representative. Should be in the 35 to 45 age range and presently handling similar accounts. Several territories open. Submit resume to RW-4099. Chemical Week.*

***Experienced Salesman wanted—Industrial chem**icals. Chemical background preferred. Worth Chemical Corporation, Greensboro, N.C.*

***Southern representation to Textile and Chem**ical Process Industry desired. Submit resume to: RW-4309, Chemical Week.*

POSITION WANTED

***South American Pharmaceutical Distributorship.** Can invest large stock. Leaving soon for Lima, Peru. Eight years chemical field experience. University graduate. Age 35. Excellent references. PW-4396, Chemical Week.*

SELLING OPPORTUNITIES WANTED

***Process Machinery Manufacturers—Eastern en**gineering sales agency offers process knowledge and engineering skill to sell, apply, install your products, RA-4344, Chemical Week.*

***Successful Sales Organization Available For** Exporters to Benelux. Here's rare opportunity for someone seeking a distribution set-up in the Benelux area! For 12 years, with great success, our firm has represented one of the largest U.S. producers of plastic materials. Only because they are setting up their own organization, we will lose one of our major products. We are seeking new plastic and chemical lines. Excellent references. Offices in Brussels and Rotterdam. Write: Imexin S.A., 5, av. de Broqueville, 15 Brussels, Belgium.*

***Need commission salesmen?—To sell your** products or to solicit contract work. We have them for you—32,000 proven commission sales agents. Albee-Campbell, Inc.,—National Clearing House for Manufacturers Agents. East Street, New Canaan, Conn.*

PROFESSIONAL SERVICES

***Wisser And Cox—Engineers-Geologists. Mineral** raw materials from exploration to marketing. 55 New Montgomery-San Francisco, California. YUkon 2-1436. Cables: GEOLOG.*

BUSINESS OPPORTUNITIES

***Chicago Bulk Chemical or Petroleum Storage** site—River front location—Railroad spurs-Access to tollways—Will build to suit—Send for booklet—Hannah Terminals, Box 89, Lemont, Illinois, Chicago, BIshop 2-3210.*

***Our technically trained, fast growing sales** company, marketers of unusual organics, seeks chemists, companies or groups that want to start, expand, or sell a plant to manufacture chemicals or related products that can profitably be marketed by dint of our mutual talents, resources, or capital. All replies strictly confidential. BO-4333, Chemical Week.*

BUSINESS OPPORTUNITY

***Desire to purchase interest in chemical or allied** products manufacturing company for alignment with similar enterprise. Replies from principals treated confidentially. BO-4457, Chemical Week.*

CONTRACT WORK WANTED

***Custom Grinding-Ultra Fine or Course-Specialty** or Volume Blending and Grinding service on unit or contract basis. Complete CO² installation for Nylon, Teflon and Heat Sensitive Materials. A Cramer Corp., 10881 S. Central Avenue, Box 682, Oak Lawn, Illinois.*

SPECIAL SERVICES

***Custom Drum Drying, pilot plant and produc**tion equipment available to drum dry and grind your product to specifications. Haberland Division. Morningstar-Paisley, Inc., 630 West 51st Street, New York 19, N.Y.*

***High Vacuum molecular distillation for large** quantity runs on a toll basis. Molecular Distillations, Inc., 527 Madison Avenue, New York 22, Tele: PLaza 3-6527.*

FOR SALE

***Send for Revised Illustrated Circular on our** $3,000,000 chemical plant liquidation at Orange, Texas. All T316 SS equipment including tanks, columns, heat exchangers, filters, centrifugals, pumps, valves, pipe, etc. Perry Equipment Corp., 1415 N. Sixth Street, Philadelphia 22, Pa.*

***Dark Dioctyl Sebacate, Bulk, 32¢ lb. DBS Plast,** Virgin Bulk 35¢ Isoprene-Enjay virgin 3 drums $15. Virgin Neopentyl Glycol-20-100# drums. Trimethylol Propane 20-100# drums. Barrett Pyridine 15A 3 orig. drums $.35/lb. DDA Plast., Virgin, 20 drs 37¢/lb. FS-4167, Chem. Wk.*

***Plasticizer: Lowest Priced primary phthalate** plasticizer; excellent solvation and efficiency, excellent compatibility with secondary plasticizers. Regularly available in transport trucks or drums. Mercury Chemical Corp., Edison, N.J., Liberty 8-1540.*

***Baker-Perkins #15-UUMM 100 gal. Dispersion** Blade mixer, 100 HP, compression cover, jacketed, motorized tilt, etc. Perry, 1415 N. 6th St., Phila. Pa.*

***Buflovak Vacuum Shelf Dryers, 110 or 98 sq.** ft., with vac. pumps, condensers, etc., Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.*

WANTED

***Stainless valves, fittings, flanges, pipe. Buy &** sell unused piping, small or large lots. Anchor Co., 240 Holden Seattle 8, Wash.*

***Double bladed heavy duty paste mixer to 20** gallons. Buy/rent. W-4451, Chemical Week.*

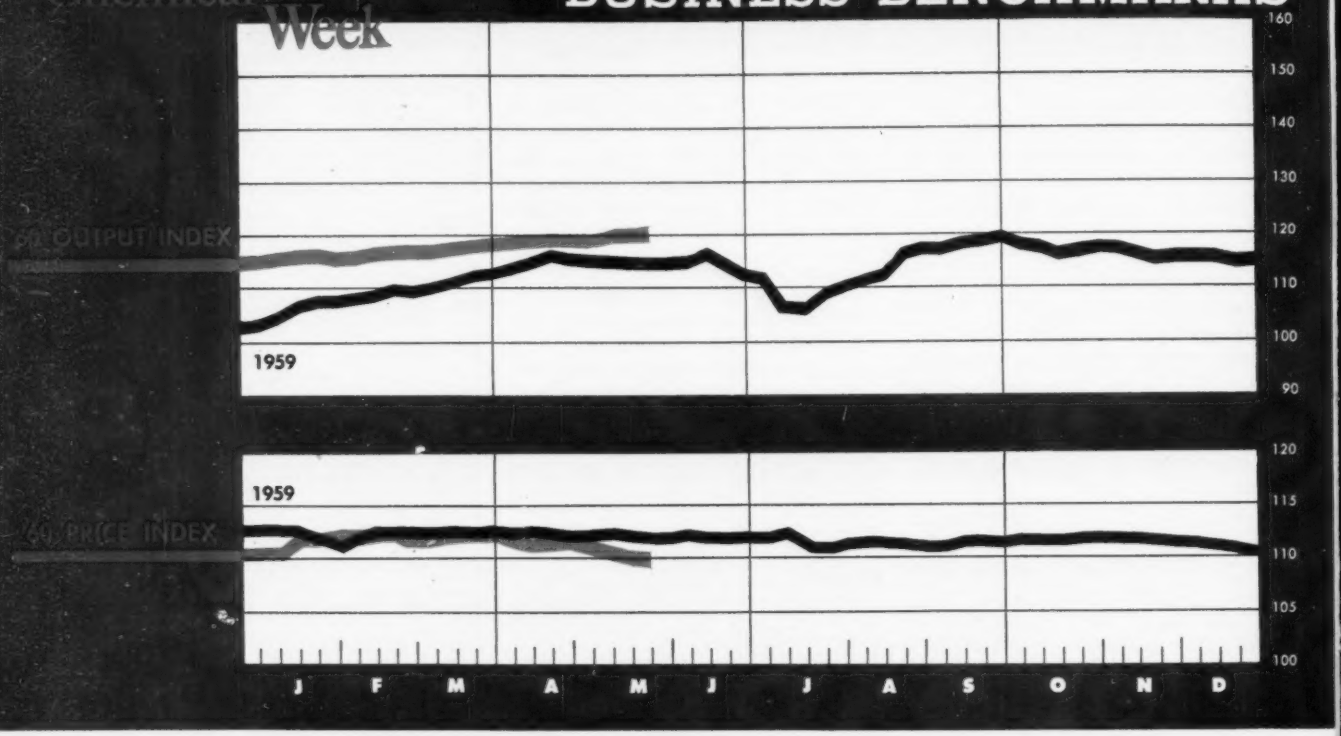
***Esterification Unit. — Chemical manufacturer** outside the U.S. desires to purchase a complete unit for the production of acetic acid esthers. Batch or continuous, with an approximate capacity for 3 tons per day. Parties interested to supply such a unit contact Mr. A. Avila. Apartado Aereo 76-07. Bogota', Colombia.*

OPPORTUNITIES

business; personal or personnel; financial; equipment; etc., may be offered or located through the classified advertising section of CHEMICAL WEEK. For more information, write to: CLASSIFIED ADVERTISING DIVISION P.O. Box 12 New York 36, New York.

Chemical Week

BUSINESS BENCHMARKS

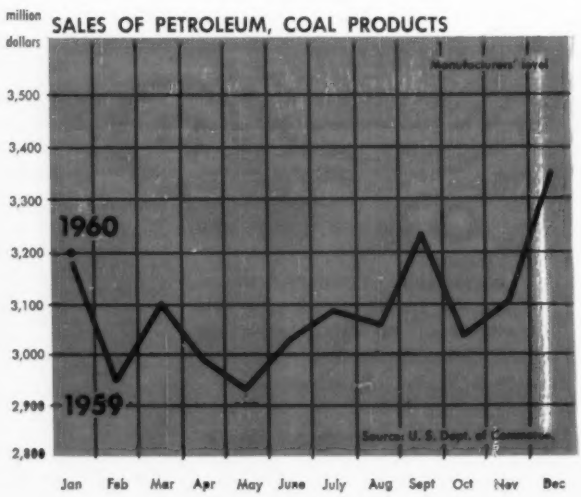


MAY 21, 1960

WEEKLY BUSINESS INDICATORS	*Latest Week*	*Preceding Week*	*Year Ago*
Chemical Week output index (1947-1949=100)	120.8	120.6	115.9
Chemical Week wholesale price index (1947=100)	108.8	108.9	112.4
Stock price index (12 firms, Standard & Poor's)	50.72	50.57	59.29
Steel ingot output (thousand tons)	2,102	2,137	2,631
Electric power (million kilowatt-hours)	13,139	13,300	12,659
Crude oil and condensate (daily av., thousand bbls.)	6,771	7,014	7,200

EMPLOYMENT INDICATORS (Thousands)	*Latest Month*	*Preceding Month*	*Year Ago*
All manufacturing	16,500	16,571	15,963
Nondurable goods	6,900	6,899	6,807
Chemicals and allied products	861	861	828
Paper and allied products	561	562	554
Rubber products	267	268	259
Petroleum and coal products	233	234	235

CHEMICAL CUSTOMERS CLOSE-UP



to make clear, no-drip dipping compounds of liquid resins

Just a little bit of Cab-o-sil saves a lot of dipcoating dollars.

2 to 5% Cab-o-sil by weight, added to the liquid resin as a thixotropic agent, stops drainage problems cold. There's no drip, no draining, no loss of resin, at either high or low temperatures, even during application.

Cab-o-sil permits a wider choice of resins, since it can usually thicken a low viscosity resin without risking the loss of the resin's wetting characteristics. Equally important, Cab-o-sil permits a wider choice of plasticizers or solvents, since flow properties are more easily regulated.

Cab-o-sil is very easily dispersed and thoroughly compatible with the liquid phase of any resin system. And, it lets you maintain perfect clarity or brightness of color, depending on your needs, since it has no effect on resin transparency or on the tinting strength of coloring pigments. The coating is easily applied, and the finish is smooth and even.

There's much more to the Cab-o-sil story. The end uses of this superfine "airborne" silica are still being explored. Here are some of the ways in which this immensely useful agent, with its superfine particle size (11.1 million billion particles per gram), its uniformly high purity (99.7%) and its chemical inertness, is being used today.

USES:

- **Thixotropic, thickening, gelling agent** — lubricating oils, greases, polyester resins, epoxy resins, plastisols, plastigels, organosols
- **Suspending agent** — paints
- **Flatting agent** — varnishes, lacquers, organosols, plastisols
- **Reinforcing agent** — rubber, silicone, latex film
- **Anticaking agent** — sulfur, insecticides
- **Antislip agent**—solvent-base floor waxes
- **Precoating material** — reproduction paper
- **Low temperature thermal insulation**
- **Pharmaceuticals and Cosmetics** — **(See bulletin #cpha-1)**

Minerals & Chemicals Div., CW

CABOT

GODFREY L. CABOT, INC.

125 High Street, Boston 10, Mass.

Please send ☐ copy of bulletin #cpla-2 (Cab-o-sil in the Plastics Industry)
☐ free Cab-o-sil sample and other technical data checked

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( ) Cab-o-sil in Butyl Rubber (#crub-2)
( ) Cab-o-sil in Dipped Latex Films (#crub-3)
( ) Cab-o-sil in the Lubricating Grease Industry (#cgre-2)
( ) Aqueous Dispersions of Cab-o-sil (#cmis-2)
( ) A Flatting Agent for Varnishes (#cpai-3)
( ) Cab-o-sil in the Reproduction Paper Industry (#cpap-1)
( ) Cab-o-sil in Automobile Polishes (#cpol-1)
( ) Cab-o-sil in Parmaceuticals and Cosmetics (#cpha-1)

Photographed with the cooperation of Mohawk Carpet Mills, Amsterdam, N. Y.

No slip showing

Modern latex backing keeps rugs attractively and economically planted. And TITANOX® white titanium dioxide pigments in the latex, put more appeal in the showroom.

Out front or quietly in the background, TITANOX white pigments give latex products that *extra* appeal that makes the difference. For the clean, bright backing of today's rugs and carpets is a far cry from the drab, dark backing of the past. It helps keep sales figures firmly planted on an upward path.

There are one or more types of TITANOX white pigment—rutile and anatase titanium dioxides, and also titanium-calcium—not only for latex coatings, but for everything that needs white pigment . . . paint, paper, rubber, plastics, inks, porcelain enamels, textiles and leather to name some. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices and warehouses in principal cities. In Canada: Canadian Titanium Pigments Ltd., Montreal.

TITANIUM PIGMENT CORPORATION
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TITANOX

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